HELLSGATE BIG GAME WINTER RANGE WILDLIFE MITIGATION SITE SPECIFIC MANAGEMENT PLAN FOR THE HELLSGATE PROJECT

1999

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Project No. 92-048
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For
UNITED STATES DEPARTMENT OF ENERGY
BONNIVILLE POWER ADMINISTRATION
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ABSTRACT

This report contains a detailed site-specific management plan for the Hellsgate Winter Range Wildlife Mitigation Project. The report provides background information about the mitigation process, the review process, mitigation acquisitions, Habitat Evaluation Procedures (HEP) and mitigation crediting, current habitat conditions, desired future habitat conditions, restoration / enhancements efforts and maps. The report describes the issues involved with mitigation, each management unit, and what activities are needed for protection, restoration and enhancement. This is a work in progress. New data from acquisition HEP studies, field data collection, permanent transects, surveys and ongoing HEP studies will continually be added to the plan, as it becomes available. The information contained in the Management Plan reflects the current knowledge concerning the mitigation lands.

ACKNOWLEDGMENTS

I would like to thank Steve Judd, co-author and project coordinator for his dedication to this project; professional input and guidance that made it possible to secure and manage these lands with BPA funding for the benefit of wildlife.

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INTRODUCTION

Project Background

The construction and operation of Federal Dams on the Columbia River system and the creation of large reservoirs affected numerous species of indigenous fish and wildlife and their habitats within the states of Montana, Oregon, Idaho and Washington. To mitigate (make equal to) for these losses the federal government created the Northwest Power Planning Council (NPPC) following the passage of the Pacific Northwest Electric Power Planning and Conservation Act of 1980. Under the provisions of the Act (NW Power Act), the Bonneville Power Administration (BPA) has the authority and obligation to fund wildlife mitigation activities approved by and included in the NPPC's Fish and Wildlife (F&W) Program. In 1989 the NPPC amended their program to include wildlife habitat losses resulting from construction and operation of Grand Coulee and Chief Joseph Dams. Consistent with Section 1003(7) of the Program's Wildlife Mitigation Rule, BPA provides funding for projects that will help attain the NPPC's mitigation goals.

In 1990, the NPPC reviewed and approved the Colville Confederated Tribes Hellsgate Big Game Winter Range Wildlife Mitigation Project (Hellsgate Project). The Hellsgate Project is currently made up of three separate ranches (the Berg brothers, W. and H. Kuehne ranches) and two separate parcels (Nespelem Bend and property north of Redford Canyon) purchased for wildlife mitigation. The lands contained similar habitat types (approximately 16,652 acres) to those that were inundated by the dams. To fully mitigate all the losses associated with these dams, additional lands need to be acquired and managed for wildlife under the Hellsgate Project. These lands could be managed separately or combined into Management Units for site specific activities. Site specific goals will be stated for each unit to manage the lands to optimize available habitat for management species (desired future conditions). In all cases, the biological requirements of wildlife and the protection of critical habitat will take precedence over all other land use considerations in the management of these lands.

Purpose

To mitigate for wildlife losses from hydropower development and operation and to restore, protect and enhance acquired wildlife habitats this site-specific management plan was developed. This site specific management plan for wildlife mitigation land (Hellsgate Project) includes habitat protection, enhancement, operation and maintenance (O&M), and monitoring and evaluation (M&E). This is a work in progress. New information from field data collection, permanent transects, surveys and HEP studies will continually be added to this plan as time goes by. New acquisition HEPs and other habitat and/or species information will also be included into this plan. The information contained in this plan reflects the current knowledge concerning the mitigation lands. The plan also describes the present habitat conditions, planned habitat enhancement activities, O&M time schedule, methods for M&E to reach the planned management goals for desired future conditions. A detailed 5-year budget is included in appendix D.

Objectives to reach the mitigation goal are described for each management unit. This plan describes each management unit's present habitat conditions, defines how to protect habitats from further degradation, describes what enhancement measures are needed to reach desired future conditions and provides a time line for these management actions.

Protective measures are defined as those steps taken to maintain habitats at baseline conditions with no further degradation of habitats. These measures include but are not limited to: Maintaining boundary fences, keep up repairs to property structures and minimize public hazards where possible, noxious weed control, prevent livestock trespass, fire protection and law enforcement, and maintain the current levels of desired tree/shrub/grass/forb communities found on the different habitats. Enhancement measures include: changing the vegetative communities to increase the species diversity and abundance, create watering areas, restoring degraded habitats for specific species by seeding and planting vegetation, and maintain and increase areas containing rare and/or cultural plants.

GENERAL DESCRIPTION OF THE HELLSGATE PROJECT AREA

Location

The Hellsgate Project lands are located in North-central Washington State on the Colville Indian Reservation (Figure 1). Most of the land units lie along the Columbia River.

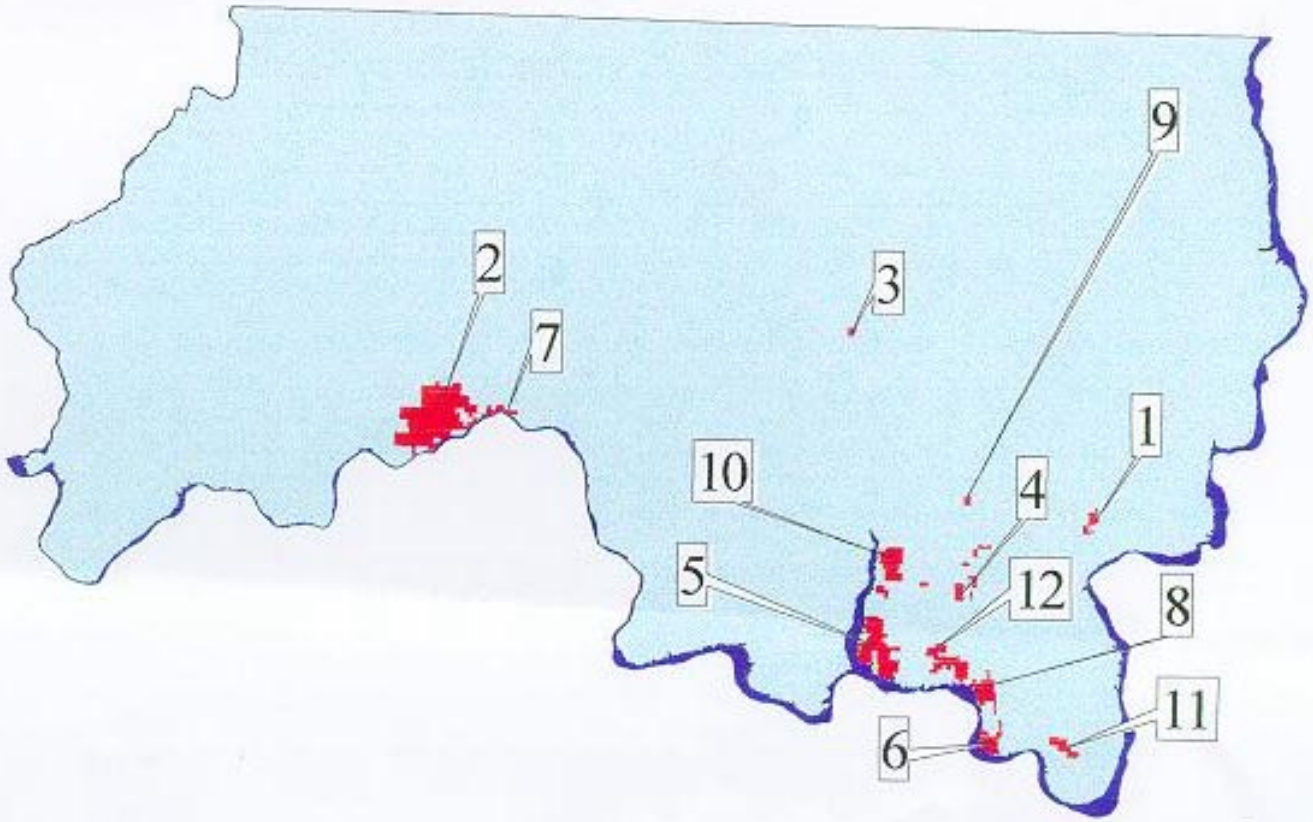
Climate

The climate of the area and Project lands is semiarid with moderate temperatures. The annual precipitation increases the further east one travels. Precipitation ranges from 10 inches on the westside to 16 inches a year on the eastern side of the Reservation. The temperature extremes in winter are moderated by the presence of Rufus Woods and Roosevelt Lakes. Most of the annual precipitation falls in the winter months as snow, or in spring as rain. Recent "El Nino" phenomena has resulted in an increase in summer precipitation and milder winter temperatures. Anticipated "La Nina" phenomena could result in a colder/wetter winter.

Geology and Soils

Glaciers at one time or another covered most of northern Washington leaving large deposits of glacial till, sand and gravel over parent granitic continental crust. The area was disturbed further by lava flows and the changing course of the Columbia River (Alt and Hyndman, 1984). The texture and depth of these deposits support distinctive vegetation associations. These distinctive soils were classified and mapped by the Soil Conservation Service (SCS, 1980) for Ferry and Okanogan Counties. The soils have unique properties separating them from other soil associations and, in turn, different plant compositions. The definite boundaries from one soil to another and characteristic vegetation allowed Project personnel to map the different habitat types. Soil names with descriptions and vegetation associations for soil polygons within a management unit are described within each section of this report.

Hellsgate Mitigation Properties



PropertyNo	Property
1	Baulne Unit
2	Berg Unit
3	Bridge Creek Unit
4	Friedlander Unit
5	Kuehne Ranch Unit
6	Lundstrom Unit
7	Nespelem Bend Unit
8	Sand Hills Unit (Kuehne)
9	Sclome Unit
10	Silver Creek Unit
11	Simons Unit
12	Williams Flat Unit

MANAGEMENT OPERATIONAL POLICIES
The following subjects are part of the actions and/or policies of this management plan.

Planning Process
This management plan will be reviewed and approved by all interested parties before large-scale habitat restoration efforts take place. Throughout the mitigation process, a Technical Task Team, a Citizens Advisory Group, state and federal agencies and various Tribal departments have contributed to this process (see Appendix A). The site specific management plan is the result of their efforts to develop the mitigation lands for the benefit of wildlife. The goal of mitigation is to protect, enhance and restore the diversity of plant and animal communities on Project lands while maintaining a balance between meeting the unique needs of wildlife and that of Tribal and non-Tribal members of the community. The main focus for the Tribes is to continue mitigating for losses that occurred from the creation and operation of Grand Coulee and Chief Joseph Dams (Tables 1a and 1b) by securing and protecting lands for wildlife using BPA funding (U.S. DOE, 1986 and U.S. DOE, 1992).

Table 1a. Summary of HU's lost due to Grand Coulee Dam Project.

Target Species	Habitat Type	Habitat Units
Sage Grouse	Shrub-steppe	893
Sharp-tailed Grouse	Grassland/Shrub-steppe	8,833
Ruffed Grouse	Lowland Forest	4,152
Mourning Dove	Agriculture/Riparian	1,923
Mule Deer	Shrub-steppe	10,827
White-tailed Deer	Lowland Forest	3,982
Riparian Forest	Riparian Forest	780
Riparian Shrub	Riparian Shrub	14
TOTAL HABITAT UNITS LOST		31,404

*Table 1a developed from habitat losses resulting from Grand Coulee Dam (U.S.DOE, 1986).

Table 1b. Summary of HU's lost due to Chief Joseph Dam Project.

Target Species	Habitat Type	Habitat Units
Mule Deer	Shrub-steppe/Mixed Forest	996
Sharp-tailed Grouse	Shrub-steppe/Grassland	1,145
Canada Geese	Island/Sandbar	106
Sage Grouse	Shrub-steppe	590
Bobcat	Rock/Rockland	200
Mink	Riparian	460
Yellow Warbler	Riparian Shrub	29
Lewis' Woodpecker	Conifer Wood./Mixed Forest	143
Pheasant	Agricultural	119
Spotted Sandpiper	Shoreline	627
TOTAL HABITAT UNITS LOST		4,415

*Table 1b developed from habitat losses resulting from Chief Joseph Dam (U.S.DOE, 1992).

Fire Management

Fire, naturally occurring or planned, has always been a source of habitat change on the Reservation. The suppression of wildfires over the last fifty years has allowed certain species to flourish and expand to areas where they were scarce. Within this site specific management plan fire will be used in one of two ways: 1. Allow naturally occurring fires to burn with minimum suppression, restoring the natural fire ecosystem on some mitigation lands and 2. Plan controlled burns to stimulate the vegetation for wildlife forage and reduce understory fuel accumulations. Burning can control unwanted plant species, fight disease, control insect infestation, and help desired species compete for available nutrients, space and soil moisture.

Specific areas that may be burned each year are listed under each management unit by cover type.

Wildlife and Habitat

This plan is designed to protect and enhance habitats so all species can function in their respective habitats. Some threatened and sensitive species of wildlife frequent this area and will benefit from mitigation activities (see section on Threatened and Endangered (T&E) species. Extirpated species may be reintroduced, following habitat restoration and/or enhancement. Wildlife distribution is dependant on suitable habitat (habitat is defined by cover type). Lands acquired for mitigation will be protected and enhanced for the benefit of wildlife. All species depend on their habitats to meet or supply specific needs or life requirements. Not all mitigation lands can do this at the present time. The baseline HEP supplied information on the quality of habitats found on the mitigation lands. Through management, these habitats can be protected, improved and enhanced for selected wildlife species. Habitat conversion and/or enhancement will be used to meet specific wildlife needs. Selected wildlife species representing diverse communities or groups of species (guilds) using the same habitat types will be used to meet mitigation objectives and crediting. Examples are creation of artificial islands and nest structures for waterfowl, creation of snags for cavity nesters, building brushpiles for upland birds and small mammals, and planting small food plots with desired forage. These management measures are short-term activities to benefit wildlife until the area reaches a natural balance meeting the needs of wildlife using those habitats. Past land use such as farming and ranching, have altered the area by changing or destroying habitats. Some important habitats are no longer present due to inundation by dams and in other areas the habitats are reduced to remnants. One of the goals of mitigation is to restore protect and enhance habitats and/or create suitable areas for habitat dependant species. These management species include mule and white-tailed deer, grouse species, waterfowl, upland birds, passerines, raptors and fur-bearers. Most species found on the mitigation lands provide cultural and subsistence uses to the Confederated Tribes of the Colville Reservation. Appendix B lists wildlife species found on mitigation lands.

Water Resource Management

Each site plan is designed to manage for water quality and quantity using goals and objectives that comply with Tribal and Federal standards for the Colville Indian Reservation. Water is life. The amount and/or duration of available water effects species composition and abundance on project lands. Generally the more water that is available, the more diverse the biotic communities become around that source. One goal of the site plan is to enhance the natural seeps and springs for use by wildlife. The area around the site may be developed to provide vegetation for forage and cover, will be fenced off from domestic livestock, and have safety

features installed to prevent wildlife from drowning. Protecting soils and increasing riparian vegetation along banks will enhance creeks and seasonal watercourses. Erosion prevention will include maintaining vegetative cover on highly erodable areas, planting vegetation to absorb excess runoff on slopes and maintaining roads with proper placement of culverts and ditches.

Riparian areas function properly when adequate vegetation, landform, and large woody debris are present to dissipate stream energy associated with seasonal high water-flows. Erosion is reduced, water quality is improved and stream channels are maintained in a desired state for both fish and wildlife species. Properly functioning riparian areas are the result of interaction among geology, soil, water and vegetation (Hunner, 1997).

Evaluating site conditions of riparian areas prior to taking management action will save time and money. To develop a realistic and effective recovery plan to repair and restore the riparian zone an understanding of the decline, the current conditions, and recovery options available are required. The riparian zone in relation to the whole watershed needs to be addressed prior to artificially planting vegetation along the stream corridor in the hope of curing degraded riparian habitats. The upland areas need to be addressed before effective riparian recovery can begin. Addressing problems in the upland areas can correct some of the problems that occur in degraded systems and allow riparian areas to come back naturally over time. Revegetation involves planting trees, shrubs, grasses and forbs to replace those species lost in riparian areas. Other recovery actions include improving livestock management, streambank stabilization, and protecting the uplands affecting the riparian zones. Evaluating the effects of land use patterns that occur or occurred within the riparian zone and eliminating the impacts thus allowing natural processes to function and restore an area is called passive restoration. Active restoration involves the replanting of the vegetative cover, in-stream structures, etc., or any other type of active manipulations. Evaluating the problems of a degraded riparian area (multiple impacts) and restoring the natural function of the system passively is preferable to active recovery strategies that address only the symptoms of site decline (Briggs, 1996). However, some riparian areas will need active restoration in order to increase or restore proper function within a reasonable time frame. The types of water sources that occur and the linear miles of surface water on the mitigation sites are listed below in table 2.

Table 2. Type, number and location of current water sources on the Hellsgate Project.

Management Units	Springs	River Frontage	Ponds	Intermittent Streams	Riparian Wetlands
Friedlander	2 Undeveloped	0	0	½ Mile	1 Mile
Sclome	0	0	0	½ mile	0
Simons	2 Undeveloped	0	0	1 ½ Miles	¼ Mile
Kuehne Ranch	2 Undeveloped	2 Miles	0	1 Mile	0
Baulne	2 Undeveloped	0	1	1 ½ Miles	½ Mile
Bridge Creek	0	¾ Mile	2	0	¼ Mile
Lundstrum	1 Undeveloped	3 ½ Miles	0	¾ Mile	0
Williams Flat	3	0	1	½ Mile	0
Sand Hills (Kuehne)	0	2 ¾ Miles	0	1 ¼ miles	0
Silver Creek	0	½ mile	0	½ Mile	1 ½ Miles
Berg	5	4 Miles	2	4 ½ miles	0
Totals	17	13 ½	6	12 ½	3 ½

Exotic Wildlife

Exotic naturalized wildlife on mitigation lands includes Ring-necked pheasants, Hungarian and Chukar partridge. These species will be managed for on an opportunistic basis, however management will focus on native wildlife species protection and encourage their expansion on mitigation lands. Native plant and wildlife species fulfill certain subsistence and ceremonial needs of the Tribes; therefore they will receive priority consideration over exotic species.

Animal Damage Control

There are no plans for a general predator control program for mitigation lands. Predators are required to help maintain balance in a healthy ecosystem. Present management will be designed to allow for natural predator prey interactions. Management activities will provide habitat to ensure security of prey populations while supporting predator populations as well. If it becomes evident, based on sound scientific data, that control of predators is necessary to maintain the desired population level of a prey species then control may be initiated. This will be on a case by case basis. If predator control becomes necessary then specific control methods such as trapping or shooting can be used (Judd, 1997). Tribal members using traditional and subsistence methods will be encouraged to harvest problem species as an effective means of predator control.

Cultural Resources

Historically, the Native Americans used natural resources for a subsistence lifestyle. Prior to the construction of the Dams, salmon was the mainstay of the people. Other wildlife species provided food, clothing, shelter and tools (Ruby and Brown, 1981). Various plant species were utilized for food, medicinal and religious purposes. The areas acquired for mitigation are rich in the history of the area. Many sites contain evidence of past settlement and are used by Native Americans today. The lands purchased for mitigation are part of the Reservation where Tribal members still utilize some of these remaining natural resources in a subsistence manner and as a part of their cultural and religious heritage. The lands contain evidence of past travel routes and winter camping areas. The lands also contain evidence of settlements such as abandoned homes, buildings, barns, and farming equipment. The Tribal History Department will work closely with management to protect and preserve any sites they deem necessary on mitigation lands. Their goal is to identify cultural resources to protect and enhance habitats for cultural, traditional, spiritual utilization for Tribal members and their families (Rice, 1997). Wildlife will be the main emphasis on these lands however cultural and subsistence use of these resources will be allowed as long as wildlife and habitats are not adversely affected. For all wildlife mitigation projects, cultural resource management planning will be integrated with wildlife management plans as a means of avoiding impacts to cultural and historic resources. A representative of Tribal History/Archeology Department will be consulted throughout the planning process to comply with Section 106 of the National Historical Preservation Act of 1966 (as amended).

Road Management

Road densities have increased on the Reservation in recent years to access stands of timber. Some species are sensitive to human disturbance and will move to undisturbed areas. To prevent species disturbance on mitigation lands new roads will be kept to a minimum and off-road traffic will be regulated. Vehicle use essentially will be restricted to established roads to protect wildlife populations, habitats and to control noxious weeds. Extensive logging in the past has produced a network of abandoned roads that crisscross mitigation lands. These old roads will be evaluated as to vehicle use in relation to adverse wildlife impacts. Some roads will be used as a trail system; others will be closed or used seasonally depending on wildlife needs in the area. Closed roads will be replanted to desired vegetation to prevent erosion and the spread of noxious weeds. The Tribes Forestry and BIA Road System Departments are working with Project personnel for the care and maintenance of roads that lie within Project lands. This site plan identifies the current road system found on the mitigation lands and addresses road densities on each management unit. The plan uses Tribal standards and guidelines to reduce road densities and/or limit access through seasonal road closures, locked gates and road removal to maximize wildlife protection. Most of the management units are accessible by main road. The secondary and logging or farm roads may be closed to unauthorized vehicle trespass to minimize impacts to wildlife using those areas. Table 3 lists the types and miles of roads on Project lands.

Table 3. Type and amount of roads currently existing on the Hellsgate Project.

Management Unit	County Road	BIA Road	Logging/Farm Road
Friedlander	0	¾ Mile	2 Miles
Sclome	0	0	½ Mile
Simons	0	1 Mile	½ Mile
Silver Creek	¾ Mile	0	1 ¾ Miles
Kuehne Ranch	1 Mile	1 ¾ Miles	5 Miles
Baulne	0	0	1 ¼ Miles
Bridge Creek	1 ¼ Miles	0	0
Lundstrum	0	¾ Mile	1 Mile
Williams Flat	0	3 Miles	4 Miles
Sand Hills	0	¾ Mile	4 Miles
Berg	3 3/8 Miles	4 ½ Miles	7 ¼ Miles
Totals	**6 3/8 Miles**	**12 ½ Miles**	**27 ¼ miles**

Forested Areas

To achieve desired habitat conditions for wildlife in forested areas, proper forest practices will be employed. Undesired species can be removed, snags can be created and desired tree species can be spaced to reduce fire danger, diseases and insect damage. No major logging is planned for the immediate future, however thinning cuts and controlled burns will be used to enhance forested habitats and meet mitigation objectives. To maximize wildlife habitats in forested areas certain management actions will have to be taken, on a case by case basis, to reach optimum conditions. The resource goal for forested areas is to provide suitable habitat conditions for desired native and non-native species to maintain biodiversity, which includes the diversity of genes, species and ecosystems, as well as the evolutionary processes that link them (Boyce and Dumas, 1997). Managed landscapes may more closely resemble those created by the activities of historic disturbances such as fire, wind, insects, disease and animals. The site plan for each management unit describes what management actions may be necessary to reach the desired future condition for those forested habitats. The management actions are designed to restore ecosystem processes by managing vegetation structure, stand density, species composition, patch size, pattern, and fuel loading and distribution so ecosystems are resilient to endemic levels of fire, insects, and disease.

Operation and Maintenance (O&M)

These O&M activities must be performed on a day to day basis on the Project. These activities include protection of purchased lands but do not include restoration or enhancement activities to habitats for wildlife. O&M activities include weed control, fence construction and maintenance, building and equipment maintenance, trespass livestock removal, vehicles and fuel, and any

other activity or expense associated with the day to day Project operations. The estimated 5-year Hellsgate Project budget is included in appendix C at the end of this document.

Weed Control

As a result of past land use practices noxious weeds have infested and/or taken over lands previously occupied by native vegetation. The goal of management is to reduce the number of weed patches and replace them with desired vegetation on these altered sites. Weed control will involve methods compatible with wildlife. Hand pulling, mechanical removal and the restricted use of some chemicals will be applied to prevent the spread of noxious weeds (Table 4). We will plant and seed the treated areas with desired vegetation to eliminate future weed problems and prevent erosion. Sensitive areas will be protected from the invasion of noxious weeds by preventing livestock trespass, groundbreaking disturbances, road construction, and off road use. Weed control is costly but necessary to protect, enhance and restore the different habitats on the mitigation lands. The Hellsgate Mitigation Project personnel work closely with other agencies (BIA Land Operations, local weed boards, USFWS, NRCS, and Tribal weed board) to use the best methods available to control noxious weeds on Project lands. Key Project personnel are licensed applicators. Treated noxious weed areas are identified with a colored dye added to the chemical herbicides. This allows Project personnel to see areas when applying chemical herbicides. Treated areas are also flagged and posted describing the chemical used, when applied and when it is safe to enter the treated area. Chemicals used are contact herbicides and have a short residual (3 days) period. Because the mitigation lands are used by Tribal members for cultural and subsistence resources we prefer to use chemicals as the last method to control noxious weeds.

Table 4. Noxious Weed Control Costs.

Contract Year	Total Acres	Acres Treated	Control Methods	**Costs
1994	4,800	113	H	$4,000
1995	9,600	100	H&C	$4,000
1996	15,900	100	H,C,&B	$4,000
1997	16,652	257	H,C,& M	$8,000
1998	16,652	210	H,C,& M	$4,000
* 1999	16,652	380	H,C,F,& M	$8,000
* 2000	18,782	350	H,C,& M	$10,000
* 2001	21,000	350	H,C,& M	$10,000
* 2002	21,000	350	H,C,F,& M	$10,000
* 2003	?	?	ALL	$10,000
* 2004	?	?	ALL	$10,000

~~Control Methods Defined~~

H = Hand Pulling

C = Chemical Applications

M = Mechanical (Mowing, Discing, etc.)

B = Biological Control (Bugs,Bacteria, etc.)

F = Prescribed Burns

NOTE: All treated areas will be seeded with desirable species following treatments.

*** Figures are estimates from FY99 on.**

****Costs - Includes labor, chemicals, equipment and materials used to control noxious weeds.**

Fencing

The Hellsgate Project contains 16,652 acres distributed over 11 management units. Some of these units were formally working cattle ranches and contain interior and exterior fencing. The rest of the mitigation lands are not fenced and subject to unauthorized livestock grazing. To protect these lands for wildlife they need to be fenced to exclude trespass livestock. Constructing new and maintaining existing fencelines will protect critical winter range for mule and white-tailed deer as well as elk using these areas. Fencing that excludes livestock from Project lands will also protect sharp-tailed grouse nesting, rearing and wintering habitat. Preventing livestock trespass will help eliminate the spread of noxious weeds and allow the natural and desired vegetation to cover mitigation lands and reduce the impacts from erosion. Table 5 describes the amount and status and estimated costs of perimeter fencing on the Hellsgate Project.

Table 5. Estimated perimeter fencing costs.

Management Unit	New Fence Miles	*Costs	Maintain Existing Fence Miles	**Costs
Berg	15	$ 75,000	11	$ 11,000
Nespelem Bend	4.5	$ 22,500	1	$ 1,000
Kuehne Ranch	0	$ -	13.5	$ 13,500
Williams Flat	0	$ -	12	$ 12,000
Sand Hills	8	$ 40,000	0	$ -
Redford Canyon	1.5	$ 7,500	0	$ -
Lundstrum	11	$ 55,000	2	$ 2,000
Bridge Creek	0	$ -	3	$ 3,000
Baulne	0	$ -	5	$ 5,000
Silver Creek	2	$ 10,000	12	$ 12,000
Sclome	2	$ 10,000	0	$ -
Simons	0	$ -	6	$ 6,000
Friedlander	7	$ 35,000	3	$ 3,000
Totals	**51 miles**	**$ 255,000**	**68.5 miles**	**$ 68,500**

*Costs for new fencelines are estimated @ $ 5,000/ mi.

**Costs for existing fencelines are estimated @ $ 1,000/mi.

Multiple Use

The mitigation lands have considerable potential for a variety of recreational opportunities that are compatible with the wildlife of the area. Boaters on Lake Roosevelt use the Reservation side for overnight camping. Some of the better sites are on the mitigation lands. Impacts to wildlife are minimal. Other areas are used by Tribal membership throughout the year for camping and subsistence purposes. The area has opportunities for hikers, bird watchers, and outdoors enthusiasts to view and take pictures of wildlife throughout their life cycle. Wildlife and habitats are the main goal of these mitigation lands and any other land use will be explored, evaluated and prioritized over time on an opportunistic or as needed basis.

Restoration and Enhancements

Many wildlife mitigation lands are not as productive due to past land uses. Restoration and enhancement activities for mitigation lands includes: controlling and/or eliminating noxious weeds, seeding of semi-permanent or native/desired permanent cover, reduction of soil erosion and improved soil conditions, production of vegetation useful in re-establishing desired habitat conditions, and prevention of the invasion of undesirable species. Enhancement activities will benefit species and habitats by providing optimum conditions for wildlife using those habitats. Once optimum habitat conditions are met the project intends to maintain those enhanced habitats for wildlife species using them. All current habitat types require some degree of enhancement, but the agricultural cover types need to be restored to conditions prior to disturbance. Examples are returning cropland back to shrub-steppe and/or grasslands. Land where watercourses were diverted to produce meadow hay will be returned to riparian shrub and/or wetlands. When habitat conditions are optimal, wildlife supplementation or reintroduction may occur on selected habitats. The resident population may or may not be protected from extinction, but the addition

of supplemental animals will likely insure maintenance of population levels consistent with project objectives. Table 6 describes management activities designed to enhance and/or restore mitigation lands to desired future conditions.

Table 6. Management activities.

Management Activity		Present Conditions	Future Conditions
FIRE	Protection	No	Fire breaks - sensitive sites
	Prescribed Burning	No	Yes to shrub-steppe
	Natural	Suppressed	Some suppression/Let burn
AGRICULTURE	Conversion	Pastureland	Yes to shrub-steppe
	Pasture	Yes	Convert to grassland
	CRP	Yes	Plant to desired species
	Dryland Crops	Yes	Desired grasses and forbs
	Irrigated Crops	No	No
LIVESTOCK GRAZING	Cattle	No	As needed for Veg. Control
	Sheep	No	As needed for Veg. Control
	Trespass Livestock	Yes	No
	Goats	No	Not planned
	Horses	No	Yes - Wild Horses
	Exotic	No	No
NOXIOUS WEED CONTROL	Mechanical Control	Some	Yes
	Biological Control	Some	Yes
	Chemical Control	Some	Yes - Spot spray rangelands
	Hand Removal	Some	Yes
TIMBER	Harvest	Yes	No
	RX by species	No	Yes - Small blocks
	Firewood	Yes	No
	Salvage	Yes	No
	Site Preperation	Yes	Minimal disturbance preferred
	Roads	Yes	No new - maintain needed
ENHANCEMENTS	Water	Some	Yes - Spring dev.& wetlands
	Cover/Plantings	No	Yes
	Forage	No	Yes - Vegetation conversions
	Fencing	Some	Maintain existing - add new
CULTURAL	Plants	No	Yes - Plant banks
MONITORING & EVALUATION	HEP Study	Some	Yes - Every 5 years
	Permanent Transects	No	Yes - Monitor every year
	Photo Points	No	Yes - Monitor every year
	Pop.Trend Data	Some	Yes - Annual wildl. Census

Monitoring and Evaluation (M&E)

Monitoring is the process by which progress toward meeting project objectives is measured. The monitoring of management units will involve varying degrees of intensity and complexity depending on the ecological site and management species. Sites being monitored will vary from areas producing their potential to areas that have a high potential to improve, but are currently in a deteriorated state. Frequency and timing of monitoring will depend upon the minimum period of time in which an area will be expected to show change or when a change in management activities is scheduled. The guidelines established by the Tribes Fish and Wildlife Department and/or HEP suitability indexes for monitoring species and/or habitats will be followed. A monitoring plan will be developed to provide management with the necessary information to make sound decisions regarding the implementation and adjustment of management activities to habitats on the mitigation lands. The plan will describe the monitoring techniques used to measure limiting habitats or critical components of a certain habitat and the frequency needed to indicate if management objectives are being met. The effects of habitat management strategies will be evaluated and monitored annually for the life of the Project. An annual report may be published each year that will cover the following:

- Determine if the management activity is working as designed or needs modification.
- Identify unanticipated impacts or unpredictable outcomes.
- Insure management activities are being implemented as scheduled.
- Provide for a continual comparison of management plan benefits versus economic, social and environmental costs.

Both temporary and permanent monitoring techniques will be used. Photo records of before and after management actions will document steps toward objectives outlined in this plan. Lek surveys and fawn counts are conducted annually on the Hellsgate Project. Other techniques to monitor wildlife species such as grouse drumming routes, nesting surveys, small mammal trapping, and flushing counts will also be used. Vegetative communities will be monitored to determine stability and / or changes over time. Non-game responses to habitat management will also be monitored. A wildlife list of relative species abundance using or occurring on mitigation lands has been developed and will be updated over time. Wildlife population surveys, conducted during the appropriate time of year, will aid in the evaluation process. Every five years a HEP will be conducted on selected habitats and compared to baseline data to document changes for the purpose of crediting. The following is a general outline of monitoring and evaluation concepts:

- Conduct an initial HEP study, and then do a HEP at 5, 10 and 20-year intervals.
- Engage photo-point monitoring annually for 5 years then every 5 years there after.
- Submit annual reports describing habitat changes and provide checks on progress.
- Continue ongoing public involvement and conduct annual interdisciplinary team meetings to provide additional checks on progress.
- Incorporate into the plan adaptive management techniques.

The process of relating monitoring to management objectives will include the following:

- Identify the site, habitat type; cover type and/or area to be monitored.
- Conduct an analysis to determine the status.

- Characterize resource values for various successional stages of the site.
- Determine the desired future conditions.
- Develop a rating system that reflects management objectives.
- Monitor the rating scores over time until desired conditions are reached.

Threatened and Endangered Species (T&E)

T&E species occurring on mitigation lands will be protected and where feasible, actions to improve their habitat will be taken. At present there are only two species, Bald eagle (*Haliaeetus luecocephalus*) and the Peregrine falcon (*Falco peregrinus*) Federally listed for protection that frequent the Project areas. More effort is needed to determine if other species occur within island communities in areas not fully sampled or identified within the Project boundaries. There are a number of Bald eagles that winter along the Columbia River on the Colville Reservation. These birds migrate through the area and roost in remote areas along the lakes. Some of these birds may be year round residents but no known nesting sites have been found on mitigation lands so far. The Peregrine falcon recovery efforts in our area include reintroduction sites along Lake Roosevelt by the National Parks Service (NPS) and the Peregrine Fund. NPS and the Tribes will monitor for return and/or nesting pairs that return to the Reservation. If reintroduction is successful, suitable Project lands may provide additional nest and/or release sites as well as foraging areas for Peregrines in the future. The following list of state sensitive and/or candidate species occur on or adjacent to Hellsgate Project lands: whiteheaded (*Picoides albolarvatus*), pileated (*Dryocopus pileatus*), and Lewis' (*Melanerpes lewis)* woodpeckers, sharp-tailed grouse (*Tympanuchus phasianellus columbians*), golden eagle (*Aquila chrysaetos*), northern goshawk (*Accipiter gentilis*), flamulated owl (*Otus flammeolus*), Columbia spotted frog (*Rana luteiventris*), tiger salamander (*Ambystoma tigrinion*), sage brush lizard (*Sceloporus graciosus*) and four species of *Myotis* bats (U.S. DOI, 1998).

Habitat Evaluation Procedures (HEP)

Initial loss assessments were made using the United States Fish and Wildlife Service (USFWS) Habitat Evaluation Procedure (HEP)(USDOE, 1980 and USDI, 1980). This methodology was developed to document the non-monetary value of fish and wildlife resources. HEP provides information on the quality and quantity of available habitat for a selected wildlife species. HEP is based on ecological principals and the assumption that habitat for selected wildlife species can be described as a numerical value known as a Habitat Suitability Index (HSI). This value is derived from an evaluation of the ability of a habitat to satisfy all the life requirements of a selected fish or wildlife species. Evaluation involves comparing existing habitat conditions to optimal habitat conditions for a selected species. The HSI value (ranging from 0.0 to 1.0) is multiplied by the area of habitat to obtain Habitat Units (HUs) which are the means used to measure or compare habitat losses and gains for mitigation. The USFWS developed and published selected species models to evaluate habitats on a nation wide basis. These "Blue Book Species Models" list species life requirements and what variables to measure in a given habitat to arrive at an HSI for that species (Appendix B). Because this is not an exact science the models can and should be modified for each local area and any changes documented. In addition "unpublished" species models can be developed, modified and used by knowledgeable biologists to determine the HSI of a selected species (Appendix B). Selection of evaluation and management species is based on loss assessments for Grand Coulee and Chief Joseph dams and Project specific habitat types. A management species and HSI models are used to document the

habitat quality for a wide range of species occupying that same habitat. Cover typing is broad based for HEP assessments and does not address individual habitat types that describe community plant associations groups at various seral stages. This management plan describes both cover types used for HEP analysis and habitat types for management purposes. Habitat types are more specific then cover types and describe the soils, aspect, species composition and available moisture that dictates what vegetative cover that area will support. Daubenmire (1952) defined "habitat type" as an area that is capable of supporting the same homogeneous plant association considering all the abiotic as well as biotic features of the ecosystem except man and his animals. In other words, a habitat type describes the potential vegetation found on an undisturbed site. For example a cover type called "grassland" may contain a single or many different "habitat types" over the same area. The grassland cover type could be composed of Bluebunch wheatgrass (*Agropyron spicatum*) or Idaho fescue (*Festuca idahoensis*) habitat types. Cover types delineated for each management unit, are further classified to specific habitat types based on soils where they grow. Groups of plants growing on suitable soil form "plant association groups" or habitat types. Daubenmire (1988) classified plants and their distribution in the steppe areas of Washington based on soil classification and climatic conditions. R. Clausnitzer and B. Zamora did the same for the Colville Indian Reservation by describing 28 plant associations or habitat types found on the Reservation (Clausnitzer and Zamora, 1987). Knowledge of these vegetative associations is helpful in restoring degraded habitats and converting existing habitat to desired future conditions for management species. Project lands contain Ponderosa pine (*Pinus ponderosa*) and Douglas fir (*Pseudotsuga menziesii*) habitat types in forested areas and Daubenmire also described habitat types for grass and shrub-steppe rangeland. R. Boyce and B. Dumas described the habitat types which indicate the current vegetation community that occupies a given site that may also contain successional stages as well (Boyce and Dumas, 1997). Using these sources, each management unit was typed by **cover, soil** and **habitat** type. Classification by habitat type allows the comparison of past, present and what desired vegetative covers can be managed for on the different soil occurring on mitigation lands. For each mitigation unit, a table is included describing habitat type, cover type for HEP, acres, future conditions, and soils. The specific management species, used for HEP and to monitor habitat conditions over time, are also included within the body of each cover type description for each management unit. Habitat descriptions are organized into groups or series having a common dominant climax species. Each habitat type is given the name of the plant association that occupies the land unit. In cases of disturbance or disclimax the dominant species indicates the habitat type. Habitat type designations are in the form of letter codes that are formed by combining the first two letters of the scientific name (Thus PIPO/PUTR indicates a Ponderosa pine/ Bitterbrush habitat type). This short hand is universally accepted and used for data collection (Appendix C lists species, codes, common and scientific names for important trees, shrubs, and herbaceous vegetation). Management of Project lands will include the use of both habitat and cover typing to protect and restore Project lands for wildlife. Habitat typing will guide restoration efforts towards desired natural conditions and cover typing allows the use of the Habitat Evaluation Procedure (HEP) for mitigation monitoring and crediting. The use of cover types allows the HEP evaluation team to: 1) identify and select appropriate evaluation species models; 2) extrapolate data from sampled areas to non-sampled areas, reducing the amount of sampling necessary; and 3) interpret HEP data. Cover types comprising less than 1 percent of a specific area were not delineated as separate polygons. HEP cover types with

associated habitat classifications are listed below with acres and percent of total area for current mitigation lands.

COVER TYPES

Project lands were cover typed using aerial photos from 1983 and 1993, field surveys and USGS topographic maps. The actual vegetation covering a site is called a "cover type". Project vegetation was classified into cover types for the purpose of HEP. Cover types used in HEP studies are general descriptions of the vegetative cover over an area comprised of that vegetative cover. The term "cover type" is defined as an area of land or water with similar physical, chemical, and biological characteristics that meet a specific standard of homogeneity (U.S. Department of Interior, 1980). For example, the grassland cover type includes all areas comprised of grass and forbs having less than five- percent shrub canopy closure. The specified standard of homogeneity is "comprised of grass and forbs having less than five percent canopy closure". Descriptions of cover types, their habitat types, and acreage occurring on the Hellsgate Big Game Winter Range Project are listed below:

Shrub-Steppe Cover

This cover type dominates the project area (6,264 acres or 38% of total). It has been altered by high levels of cattle and horse densities associated with past ranching activities reducing the diversity and productivity of native shrub-steppe communities as described by Daubenmire (1988). This cover type can be comprised of multiple habitat types that occur on drier sites occupied by shrubs and herbaceous vegetation. Typically, grasses, bare ground, litter, rock, and erosion pavement dominate the ground surface. The shrub-steppe is primarily rangeland, devoid of tree canopy closure, and dominated by species such as bitterbrush (*Purshia tridentata*), sagebrush (*Artemisia tridentata*), rabbitbrush (*Chrysothamnus nauseosus*), cactus (*Opuntia fragilus*), serviceberry (*Amelanchier alnifolia*), and current (*Ribes cereum*). Grass species within this cover type include cheatgrass, Bluebunch wheatgrass, needle-n-thread (*Stipa comata*), Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa sandbergii*), basin wildrye (*Elymus cinereus*), and three-awn grass (*Aristida circinales*). This cover type is usually described as dry sites devoid of trees with vegetative cover comprised of shrubs, grasses and forbs. Habitat types found in this cover type include:

A. Agropyron series

- AGSP/POSA – This habitat type is dominated by bluebunch wheatgrass and Sandberg bluegrass.
- AGSP/STCO – This habitat type is dominated by bluebunch wheatgrass and/or needle-n-thread bunchgrasses.

B. Purshia tridentata series

- PUTR/AGSP – This habitat type is dominated by Bitterbrush with the understory grasses dominated by bluebunch wheatgrass.
- PUTR/FEID - This habitat type is dominated by Bitterbrush with the understory grasses dominated by Idaho fescue.

C. Artemisia tridentata series

- ARTR/AGSP - This habitat type is dominated by sagebrush with the understory grasses dominated by bluebunch wheatgrass.

- CHNA/BRTE - This is a disclimax of the ARTR/AGSP habitat type and occurs only on disturbed sites and is dominated by rabbitbrush with the understory grasses dominated by cheatgrass.

Agriculture Cover

This is the fourth largest cover type and contains different habitat types depending on the location of the area (2,360 acres or 14% of total). It is comprised of native vegetation sites converted by man for the production of agricultural crops such as cereal grains, alfalfa (*Medicago sativa*). Some of this land is now enrolled in the Conservation Reserve program (CRP). Farm buildings, equipment piles, and private roads are also considered part of this cover type. These sites are usually flat benches found along the river. The majority of the land converted to agricultural purposes was AGSP/STCO, AGSP/POSA, PIPO/AGSP, ARTR/AGSP, PUTR/AGSP, and PSME/SYAL habitat types. Because habitat quality is limited by the large seasonal variations in vegetative structure, this cover type will be converted over time back to vegetation the habitat types will support for wildlife. The land on the Berg unit that was used to grow agricultural crops was planted to CRP grasses such as crested wheatgrass (*Agropyron cristatum*) and/or intermediate wheatgrass (*Agropyron intermedium*) and used sometimes as pasture, but these lands were never enrolled into CRP. A total of 804.5 acres of this cover type were entered into the CRP in 1987. These lands are distributed over the project area on the following units: Williams Flat, Simons, Kuehne Ranch, Silver Creek, Baulne and Friedlander Units. Under the new enrollment program (1998-2008) only 683.5 acres are eligible. Three areas, Williams Flat and Simons Units and part of the Silver Creek Unit are enrolled into the new CRP. The Project goal and the CRP goal are similar in that these lands will be managed to protect and enhance critical habitat for the benefit of wildlife. Fences will be maintained to prevent livestock trespass and weed control measures performed by contractual obligations under the new CRP. Habitat types found in this cover type include:

- AGCR/AGIN – This habitat type is a cultivated mix of crested and intermediate wheatgrasses planted in CRP fields.
- AGSP/POSA – This habitat type is dominated by bluebunch wheatgrass and Sandberg bluegrass.
- PUTR/AGSP – This habitat type is dominated by bitterbrush with the understory grasses dominated by bluebunch wheatgrass.
- PIPO/AGSP - This habitat type is dominated by scattered stands of Ponderosa pine with the understory grasses dominated by bluebunch wheatgrass.
- ARTE/AGSP - This habitat type is dominated by sagebrush with the understory grasses dominated by bluebunch wheatgrass.
- PSME/SYAL - This habitat type occurs as conifer forest dominated by Douglas fir with the understory shrubs dominated by snowberry (*Symphoricarpus albus*).

Grassland Cover

3,108 acres (19% of Total)

This cover type occurs mainly on the Berg Unit. It is comprised of grasses and forbs with less than 5 percent of the area containing shrubs. Through past land use (cattle grazing) and suppression of wildfires this cover type was converted to the shrub-steppe cover type. The habitat types that occur within this cover type are:

- AGSP/POSA – This habitat type is dominated by bluebunch wheatgrass and Sandberg bluegrass.
  The majority of the grassland cover type was composed of this habitat type.
- AGSP/STCO - This habitat type is dominated by bluebunch wheatgrass and/or needle-n-thread bunchgrasses.
- BRTE/ CHNA - This is a disclimax of the ARTR/AGSP habitat type and occurs only on disturbed sites and is dominated by rabbitbrush with the understory grasses dominated by cheatgrass.

Conifer Woodland Cover
1,365 acres (8% of Total)
This cover type is similar to the conifer forest type except the stands of pine and/or fir trees are more open or scattered with less than 20 to 40 percent canopy closure. The main habitat type for this cover type is PIPO/PUTR and the majority is located on the Sand Hills and Williams Flat units.

- PIPO/ PUTR/ FEID phase – This habitat type is dominated by Ponderosa pine with bitterbrush the understory shrub. The dominance of Idaho fescue in the herbaceous layer suggests conditions more favorable to plant establishment and growth (higher elevation and/or more moisture).
- PIPO/AGSP – This habitat type is similar to the one above except environmental conditions preclude a shrub layer and only grasses and forbs are able to tolerate the droughty conditions, establish and grow within this habitat type.

Conifer Forest Cover
2,656 acres (16 % of Total)
This is the third largest cover type and occurs on upland areas containing Ponderosa pine and/or Douglas Fir with associated understory vegetation. It is defined as stands of pine and/or fir trees with greater than 70 percent conifers with 40 to 70 percent canopy closure. Understory species may include oceanspray (*Holodiscus discolor*), current, redstem ceanothus (*Ceanothus sanguineus*), ninebark (*Physocarpus malvaceus*), snowberry, and bitterbrush. Habitat types found in this cover type are mainly the Douglas fir climax series:

- PSME/SYAL – This habitat type is dominated by Douglas fir with a well developed shrub understory composed of snowberry and/or spirea.
- PSME/CARU- This habitat type is dominated by Douglas fir with a pinegrass understory. Fire appears to be the dominant factor in past stand development.
- PIPO/ PUTR/ FEID phase – This habitat type is dominated by Ponderosa pine with antelope bitterbrush the understory shrub. The dominance of Idaho fescue in the herbaceous layer suggests conditions more favorable to plant establishment and growth (higher elevation and/or more moisture).
- PIPO/AGSP – This habitat type is similar to the one above except environmental conditions preclude a shrub layer and only grasses and forbs are able to tolerate the droughty conditions, establish and grow within this habitat type.
- PSME/HODI – This habitat type association is dominated by Douglas fir with a shrub-rich understory composed mostly of oceanspray and snowberry with spirea common.

Riparian Cover Types

Riparian is defined as pertaining to a riverbank (Allaby, 1994). Biologists use the term r*iparian* to describe vegetation, habitat or an ecosystem that is associated with water (lakes, streams, reservoirs, etc.) or dependant on the existence of seasonal and/or subsurface waters drainage. Briggs describes the term riparian as having a broad range of meaning, and the extent of a riparian area is determined by several parameters, including water availability, topography, and vegetation characteristics (Briggs, 1996). Riparian areas take on various forms and are often characterized by their plant communities. Riparian ecosystems on the Reservation tend to be narrow with abrupt transitions between upland and riparian vegetation communities. A changes in the elevation, fluvial geomorphic processes, stream bearing, flow regime, stream gradient, and geology appear to limit the vegetative species composition within riparian zones. Human impacts such as logging and overgrazing have eliminated species and caused compositional changes to plant communities along riparian corridors. This cover type occurs in all the management units wherever water is present. Riparian cover consists of areas in and around water sources such as streams, lakes, ponds, ephemeral springs, or meadows that may or may not contain deciduous trees and/or shrubs. Common trees and shrubs associated with this cover type include: alder, cottonwood, red-osier dogwood, hawthorn, willow, water birch, serviceberry, chockecherry, smooth sumac, blue-berry elder, snowberry, and rose. The cover type ranges in size from 2 acres up to 30 acres and is extremely important to wildlife for food, cover, shelter and nesting habitat. Because this term covers a wide range of habitats, this report breaks riparian areas into three distinct cover types as follows; riverine, shrub wetland and forested wetland (Cowardin, Lewis, Carter, Golet, and LaRoe, 1979).

Riverine

336 acres (2% of Total)

This cover type is defined as areas with flowing surface water bounded by uplands or by the channel banks, including braided streams and floodplains. The vegetation found in and along the stream corridors includes trees (deciduous and coniferous), shrubs, grasses, forbs, and some emergent plants. The mink was used to evaluate this cover type on mitigation lands.

Shrub Wetland

75 acres (0.5 % of Total)

This cover type is dominated by woody vegetation less than 20 feet in height. Also called riparian shrubland it is comprised of true shrubs, young trees and trees or shrubs stunted due to environmental conditions. Dumas defined deciduous woodlands (shrub wetlands) as an ecosystem dominated by plant species that are broad-leaved, deciduous, and woody by nature (Dumas, et al., 1997). Plant species common to shrub wetland habitats, often called "hardwoods" on the reservation, include thin-leaf alder (*Alnus tenuifolia*), red-osier dogwood (*Cornus stolonifera*), water birch (*Betula occidentalis*), aspen (*Populus tremuloides*), cottonwood (*Populus trichocarpa*), Rocky Mountain maple (*Acer glabrum*) and willow (*Salix* sp). The Yellow warbler was used to evaluate this cover type on the mitigation lands.

Forested Wetland

208 acres (1% of Total)

This cover type is dominated by woody vegetation that is 20 feet or taller. This cover type occurs along floodplains and normally possesses an overstory of trees, an understory of small

trees or shrubs, and a herbaceous layer. It occurs where deciduous trees and shrubs mix with conifer forest species in or near surface water. Species occurring in this cover type include hawthorn, alder, aspen, mountain maple, and willow in/or near surface water with Douglas fir and/or Ponderosa pine bordering these areas. Mink, Blue grouse, and Downy woodpecker were the species used to evaluate this cover type on Project lands. This cover type, described in other reports, is sometimes referred to as riparian forest or mixed forest cover types. The climax habitat type that occurs in this cover type is mostly PSME/ SYAL.

- PSME/SYAL – This habitat type is dominated by Douglas fir with a well developed shrub understory composed of snowberry and/or spirea.

Rock Cover
220 acres (1% of Total)
Most of the rock cover type occurs on the Nespelem Bend area of the Berg unit. A small number of talus escarpments with haystack rocks (34 acres) occur on the Williams Flat unit. The rock areas do not support abundant forage or cover. However the immediate area surrounding the rock outcrops or individual rocks form a protected micro-environment containing more moisture throughout the year thus supporting vegetation in what are known as garland communities. The species that make up this vegetation depends on depth of soil and aspect. No specific habitat type associations are identified with this cover type. However these garland communities often add considerable biological diversity to the area.

Shoreline Cover
60 acres (0.4 % of Total)
This cover type consists of all areas bordering Roosevelt or Rufus Woods Lakes. It covers the exposed areas of beach between the lake surface and the high water mark. The area is mostly devoid of vegetative cover and is composed of sand, gravel, cobble or rock. Future management activities will concentrate on increasing the riparian band of vegetation along the water/land edge. There are no specific habitat type associations for this cover type.

Table 7. Summary of HEP Cover Types.

		HEP COVER TYPES									
PROPERTY	ACRES	S-STEPPE	AGLAND	GRASS	CON-FOR	CON-WOOD	FOR WET	RIVERINE	SHRUB WET	SHORE	ROCK
W. Kuehne											
Ranch Unit	1,441	1252	130	0	0	30	0	29	0	0	0
Williams Flat	950	250	210	0	120	320	0	16	0	0	34
Sand Hills	460	275	0	0	0	160	0	25	0	0	0
Lundstrum	405	155	233	0	0	0	0	2	0	14	1
Simons Unit	615	78	260	0	174	84	0	19	0	0	0
Baulne Unit	140	0	80	0	60	0	0	0	0	0	0
Sclome Unit	120	0	0	0	112	0	0	8	0	0	0
Bridge Creek	63	0	25	0	0	0	8	30	0	0	0
Friedlander	620	0	16	0	586	0	0	18	0	0	0
SUBTOTALS	4,814	2,010	954	0	1,052	594	8	147	0	14	35
H. Kuehne											
Silver Creek	1,583	40	260	0	1185	87	0	11	0	0	0
Ranch Unit	1374	1200	47	0	0	63	50	10	0	4	0
Williams Flat	570	20	240	0	180	50	70	10	0	0	0
Lundstrum	464	22	200	0	0	150	80	8	0	4	0
Sand Hills	369	107	0	0	0	241	0	3	0	18	0
Baulne Unit	226	0	80	0	131	0	0	15	0	0	0
Friedlander	140	0	32	0	100	0	0	8	0	0	0
Bridge Creek	74	15	0	0	8	0	0	8	43	0	0
SUBTOTALS	4,800	1,404	859	0	1,604	591	200	73	43	26	0
Berg Brothers	6,300	2,402	547	3,108	0	150	0	41	32	20	0
Nespelem Bend	517	257	0	0	0	0	0	75	0	0	185
Redford Canyon	221	191	0	0	0	30	0	0	0	0	0
TOTALS	16,652	6,264	2,360	3,108	2,656	1,365	208	336	75	60	220
PERCENT	100%	38%	14%	19%	16%	8%	1%	2%	0.5%	0.4%	1%

MANAGEMENT SPECIES

These species were chosen as representatives for the variety of species found in the various habitat types. These species will be used to manage and monitor habitat changes over time for the benefit of all species using those habitat types. A HEP was conducted to document baseline data and the same species will be used over time to document the habitat changes for each different habitat cover type.

These species have specific requirements and/or needs that they obtain from the habitat types. These requirements or habitat variables are listed for each management species. The species used for mitigating hydropower losses and those used for management purposes are listed below with their habitat requirements.

Sharp-tailed Grouse (*Tympanuchus phasianellus*)

A Gallinaceous or fowl-like bird of the Phasianidae family which includes pheasants, quail, partridges, and turkeys. Grouse belong to the sub-family Tetraoninae or ground-dwelling, chicken-like birds, larger than quail and lacking the long tail feathers of pheasants. Sharp-tailed grouse are pale, speckled brown and gray looking like female pheasants but with short pointed tails. Males and females look alike except displaying males inflate purplish neck sacs. The sharp-tailed grouse is listed as threatened in Washington State. This species was selected to represent species using shrub-steppe, agricultural, and grassland cover types. Species anticipated to benefit from mitigation protection include sharp-tailed and sage grouse, sage sparrow, burrowing owl, white-tailed jackrabbit, partridge, and pheasant. An unpublished sharp-tailed grouse model (Ashley and Berger, 1990) was used to evaluate agricultural, shrub-steppe, and grassland cover types. The model uses the following variables in the HEP evaluation; mean visual obstruction reading (VOR) of residual vegetation, percent slope-general landscape, distance between nesting/winter habitat, percent VOR preferred winter forage species, presence/absence of grain crops, distance to roosting, loafing, and hiding cover, suitability index for winter food value from grain, and percent equivalent area providing winter food/cover.

Mule Deer (*Odocoileus hemionus*)

Medium sized member of the *Cervidae* family. This family includes hoofed mammals that have antlers that are shed annually. The mule deer inhabits coniferous forest, conifer woodlands, shrub-steppe, and grasslands with shrubs. Typically mule deer are reddish brown in color with lighter or whitish underside and inside of legs. The coat becomes grayer during the winter months. The ears are large and mule-like, and the rump is white with a black-tipped tail. Mule deer are browsers that feed mostly on shrubs and twigs, but also add grasses and forbs to the diet depending on time of the year. This is an important species on the Reservation for subsistence and cultural reasons. The mule deer was the species selected to represent species using various cover types, notably shrub-steppe and conifer woodland cover types. An unpublished mule deer model (Ashley, 1990) was used to assess the cover types mentioned above. The model has nine variables that evaluate each cover type. They are; percent cover of preferred shrubs, percent of shrub crown cover, number of preferred shrub species, percent cover of preferred grass species, percent of available winter habitat in alfalfa/wheat, percent canopy cover of evergreen woody vegetation, topographic diversity, road densities per square mile, and solar radiation index (aspect).

Mourning Dove (*Zenaida macroura*)
Family Columbidae, plump fast-flying birds with small heads, similar sexes, and low cooing voices. Mourning doves are brown and gray, pigeon sized but slimmer, with pointed tails with large white spots. This species was used to evaluate mitigation lands containing grassland/agricultural cover types. The agricultural cover type will be converted to support vegetation listed by habitat type association for each specific soil type on each management unit. A different management species may be selected at the time of conversion and evaluated using a new HEP species. An unpublished mourning dove model (USFWS, 1978) was used to evaluate the agricultural cover type. The model measures the following variables, seed source availability, distance to water, interspersion of forest to cultivated land, and percent canopy cover of trees.

Mink (*Mustela vison*)
One of the *Mustelidae* family which includes weasels, skunks, river otters, fishers, and martens. This family includes furbearing mammals with anal scent glands. Mink have long slender bodies and short legs, with short rounded ears. Mink inhabit essentially aquatic areas and are never very far from water. They are found in marshes, swamps, ponds, lakes and rivers. They prey on small mammals, birds, eggs, frogs, crayfish, and fish. They are chiefly nocturnal and excellent swimmers. The mink was used to evaluate riparian and riparian forest cover types. A published mink model (Allen, 1986) was used to evaluate these cover types. Six variables are used to evaluate the suitability of these cover types for mink. The first variable measured was the percent of year that surface water was present. The next variable measured the percent of tree canopy cover. The third variable measured the percent of shrub canopy cover. The forth variable measured the percent of canopy cover of emergent vegetation. The fifth variable measured the percent of canopy cover of trees and shrubs within 100 m of the wetland edge. The last variable measured the percent of canopy cover along the shoreline.

Yellow Warbler (*Dendroica petechia*)
Family Emberizidae, sub-family Parulidae that describes active, brightly colored birds, usually smaller than sparrows, with thin, needle-pointed bills. This species was chosen to represent species dependant upon riparian shrub cover for life requirements. A published yellow warbler model (Schroeder, 1987) was used to evaluate riparian shrub cover on Project lands. The model consists of three variables; percent deciduous shrub crown cover, average height of deciduous shrub canopy, and percent of deciduous shrub canopy comprised of hydrophytic shrubs.

Canada Geese (*Branta canadensis*)
Family *Anatidae* includes web-footed waterfowl; geese belong to the *Anserini* tribe. This tribe describes large, heavy bodied, gregarious waterfowl, having long necks with bills thick at the base, noisy in flight with sexes alike in size and coloration. The evaluation model for Canada goose was from a modified HEP model (Sather-Blair and Preston, 1985) developed for the Palisades Reservoir on the Snake River. The model evaluates shoreline habitat for Canada geese. There are only two variables, nesting habitat and brood rearing habitat.

Spotted Sandpiper (*Actitis macularia*)
Family Scolopacidae includes small to medium sized waders, with slender bills. Sexes are similar.

Spotted sandpiper was selected for evaluating the shoreline cover types. This species model (Dorsey, 1991) has three variables that measure the quality of nesting cover and foraging habitat along shorelines. A published spotted sandpiper model was used to evaluate shoreline habitat (Dorsey, 1987). The model contains three variables to evaluate shoreline cover types. The first variable evaluates available nesting cover by measuring the percent of herbaceous ground cover of grasses and forbs less than 2 feet high. The second variable evaluates optimum nesting habitat within 75 feet of water. The third variable measures the percent of organic ground cover for foraging habitat.

Downy Woodpecker (*Picoides pubescens*)
The Downy woodpecker is a member of the *Picidae* family which includes chisel-billed, wood boring, birds with strong zygodactyl feet (usually two toes front, two rear), long tongues, and stiff spiny tails for climbing. This species looks like a smaller version of the Hairy woodpecker, checkered and spotted with white and black markings, with white backs and only the males have a small red patch on the back of the head. The bill on the Downy woodpecker is much smaller than the Hairy woodpecker and is used for identification at close range. A published downy woodpecker model (Schroeder, 1983) was used to evaluate riparian and conifer forest cover types. The model used two variables to determine the food and reproductive requirements of this species. The variables measured the basal area and number of snags greater than 6 inches diameter breast height (dbh) per acre.

Blue grouse (*Dendragapus obscurus*)
A Gallinaceous or fowl-like bird of the Phasianidae family which includes pheasants, quail, partridges, and turkeys. Grouse belong to the sub-family Tetraoninae or ground-dwelling, chicken-like birds, larger than quail and lacking the long tail feathers of pheasants. Male blue grouse are dusky or sooty colored, with blackish tails, while the females are brown and similar to ruffed grouse except ruffed grouse have a lighter tail, with the tip having a bold black band. Blue grouse were selected to evaluate conifer and riparian forest cover types. Species anticipated to benefit from managing this cover type include small mammals, osprey, bald eagle, ruffed grouse, sharp-shinned hawk, Cooper's hawk, sapsuckers, bluebird, squirrel, goshawk, bat, white-tailed deer, elk, and cavity nesters. A published blue grouse model (Schroeder, 1984) was used to evaluate conifer and riparian forest cover types on the mitigation lands. The HEP model measured the following variables; percent canopy cover over the entire area, percent shrub crown cover, average height of shrub canopy, percent herbaceous canopy cover, average height of herbaceous canopy, diversity of herbaceous vegetation and distance to forest cover type.

Bobcat (*Felis rufa*)
A medium-sized cat commonly found with thick soft yellow-brown or buff fur above and flecked with black and whitish with black spots below. Upper parts of legs banded. Males are larger than females. Found over most of the USA and common in Washington State. Habitat preferences include shrubs, open woodlands, forests, rocky deserts, and even swamps. Bobcats feed on a wide range of animals up to the size of deer. On the Colville Reservation they feed on woodrats, porcupines, small mammals, and birds. This species was selected to represent species using the rock and rockland cover types. Species anticipated to benefit from managing this cover type include bobcat, yellow-bellied marmot, bushy-tailed woodrat, cotton-tailed rabbit, quail, golden eagle, and rattlesnake. An unpublished bobcat model (Bodurtha, 1991) was used

to evaluate rock cover types. The model uses four variables to measure suitability for bobcat. They are percent canopy cover of herbaceous vegetation, shrub distribution, percent canopy cover of shrubs, and percent of area comprised of rock piles, rock outcrops, rocky ledges, boulder fields, talus slopes, and cliffs.

Lewis' Woodpecker

The Lewis' woodpecker (*Melanerpes lewis*) is a member of the *Picidae* family which includes chisel-billed, wood boring, birds with strong zygodactyl feet (usually two toes front, two rear), long tongues, and stiff spiny tails for climbing. Lewis' woodpeckers are described as large, dark, black-backed, with wide wings, pink underparts, with a wide gray collar and dark red face patch. This species is the only North American woodpecker with an extensive pinkish red belly. Sexes are similar. The Lewis' woodpecker was used to evaluate the conifer woodland cover type. A published HEP model (Sousa, 1982) used in the evaluation measured the following three variables; percent tree canopy closure, percent shrub crown cover, and number of snags (> 12 inches dbh) per acre.

Summarized below in Table 8 are the former ownership, acres, HEP evaluation species, HEP cover types and baseline habitat units for current lands that make up the Hellsgate Project.

Table 8. Summary of acres evaluated and baseline habitat units.

ACRES	SPECIES	COVER TYPE	HU'S
Former William Kuehne Property			
2,010	Sharp-tailed Grouse	Shrub-steppe	804
2,010	Mule Deer	Shrub-steppe	1,005
954	Sharp-tailed Grouse	Grassland	382
954	Mourning Dove	Agriculture	572
1,052	Blue Grouse	Conifer Forest	947
8	Blue Grouse	Riparian Forest	7
147	Mink	Riparian	44
14	Spotted Sandpiper	Shoreline	10
35	Bobcat	Rock	21
594	Mule Deer	Conifer Woodland	297
Former Henry Kuehne Property			
1,404	Sharp-tailed Grouse	Shrub-steppe	842
1,404	Mule Deer	Shrub-steppe	702
859	Mourning Dove	Agriculture	429
859	Sharp-tailed Grouse	Grassland	43
1,604	Downy Woodpecker	Conifer Forest	1,283
200	Downy Woodpecker	Forested Wetlands	160
73	Mink	Riverine	22
26	Canada Goose	Shoreline	6
591	Mule Deer	Conifer Woodland	295
43	Yellow Warbler	Shrub Wetlands	13
Former Berg Property			
2,402	Sharp-tailed grouse	Shrub-steppe	721
2,402	Mule Deer	Shrub-steppe	721
547	Sharp-tailed Grouse	Agriculture	109
41	Mink	Riverine	8
20	Canada Goose	Shoreline	4
150	Lewis' Woodpecker	Conifer Woodland	30
3,108	Sharp-tailed grouse	Grassland	1,243
3.108	Mule Deer	Grassland	715
32	Yellow Warbler	Shrub Wetlands	13
Former Nespelem Bend Property			
257	Mule Deer	Shrub-steppe	115
75	Mink	Riverine	37
185	Bobcat	Rock	111
Former Holdings near Redford Canyon			
191	Mule deer	Shrub-steppe	103
30	Lewis' Woodpecker	Conifer Woodland	15

MANAGEMENT UNITS

The Hellsgate Project is made up of three ranches and some separate parcels combined into 12 management units. Approximately 16,652 acres have been divided into these management units by geographical location or relation to other mitigation lands. Each management unit is described below and a site plan follows each description as to management species, current and desired future conditions. Topographic and soil maps of the units are also included. Project lands are not homogeneous with respect to climate or geology. The precipitation gradient increases from west to east across the Reservation but the geology (sedimentary deposits from eroded granite bedrock) is similar across the same area. Project lands contain a mixture of grasslands, shrub-lands, forests and wetlands.

The Berg Management Unit

This unit is composed of two separate properties, the former Berg Brothers ranch and the Nespelem Bend parcel. The Berg Brothers cattle ranch is primarily rangeland with scattered stands or individual Ponderosa pine trees. Starting at the north shoreline of the Columbia River, the land rises in a series of benches up to Whitmore Mountain on the west and Hamilton Ridge on the east (Figure 2). Hopkins Canyon, the largest drainage, bisects the property north and south. Other than Rufus Woods Lake (Columbia River below Grand Coulee Dam), there are few sources of year round water for wildlife. Some springs and, in wet years, small lakes occur along the north end of Hopkins Canyon. Over the course of many years, the Berg Brothers bought up five small farms in the area to increase their ranch to 6,300 acres. The original ranch home site was built in 1952 and was located in the center of the property. The only water source was a spring that dried up every summer. Water had to be hauled in for domestic and livestock use. In 1968, this site was abandoned in favor of the present ranch site, which has a year round water supply. Over time a barn and various outbuildings were added. The house is currently rented to the Wildlife Area Manager of the Hellsgate Wildlife Mitigation Project and the outbuildings are used to house Project equipment. The area is dry with normal yearly precipitation of less than 10 inches of moisture. Fall, late winter snow and/or rain make up most of this moisture. Spring rains are infrequent and of short duration. Most of the area is in rangeland with some agricultural fields used to produce alfalfa hay. The land does not support abundant stands of trees and/or deciduous shrubs except along the intermittent watercourses. Severe winter weather is moderated somewhat by the presence of Rufus Woods Lake. The area was primarily grassland but now sage and bitterbrush dominate the landscape. The livestock grazing and the lack of fire changed the native vegetation growing on this parcel. Where irrigation was used, the soils supported crops of alfalfa and cereal grains. Cattle production was the main land use. Farming was secondary and used to feed the livestock operation. A total of 700 acres was planted to cereal grains and/or alfalfa. The area supports a variety of wildlife including waterfowl along the lake, grouse, pheasant, quail, doves, and songbirds in the grassland, and woodpeckers, deer, coyotes and other small mammals in other habitats over the landscape. This mitigation site has high potential for restoration and enhancement.

The Nespelem Bend Property

The Nespelem Bend property that lies along the Columbia River (Rufus Woods Lake) in Okanogan County east of the Berg Brothers property will be separated so a portion of the property can be treated as a unit for this site plan (Figure 3). This property is a series of parcels between Rufus Woods Lake and the rocky terraces bordering to the north. The soils and

weather patterns are similar to the Berg parcel except there is more rock habitat on this site (Figure 5). Historically the land was used for grazing and as a feed lot for cattle and sheep during the winter months. Overgrazing has changed the vegetative shrub, grass and forb community leaving noxious weeds, cheatgrass and cactus as the dominant understory vegetation. The land has cultural value to the Tribes because of the historic settlements found here. The land provides critical winter range for both mule and white-tailed deer. Other species of wildlife, from small mammals to waterfowl, utilize this area either seasonally or year round. Bobcats are particularly fond of the rock cover type contained on this parcel.

Soils

Soils of the area are sedimentary lake deposits resulting from eroded granite bedrock. They are extremely well drained sandy loam, course sands, and gravel with little or no organic matter in the top layer (Figure 4). Rock outcrops occur along Rufus Woods Lake extending outwards as finger ridges perpendicular to the lake. The soils supported grasses and shrubs on the flat terraces above the river and some scattered pockets of Ponderosa pine trees in the valleys between ridges.

Management Goals for this unit

To manage this and the Nespelem Bend unit as shrub-steppe grasslands for a variety of wildlife dependant on grassland habitat, primarily sharp-tailed grouse and mule deer winter range. The agricultural areas will be converted back to shrub and/or grasslands. Fire, livestock and mechanical methods will be used to manage and maintain this area for selected wildlife.

Short-term Management Goals

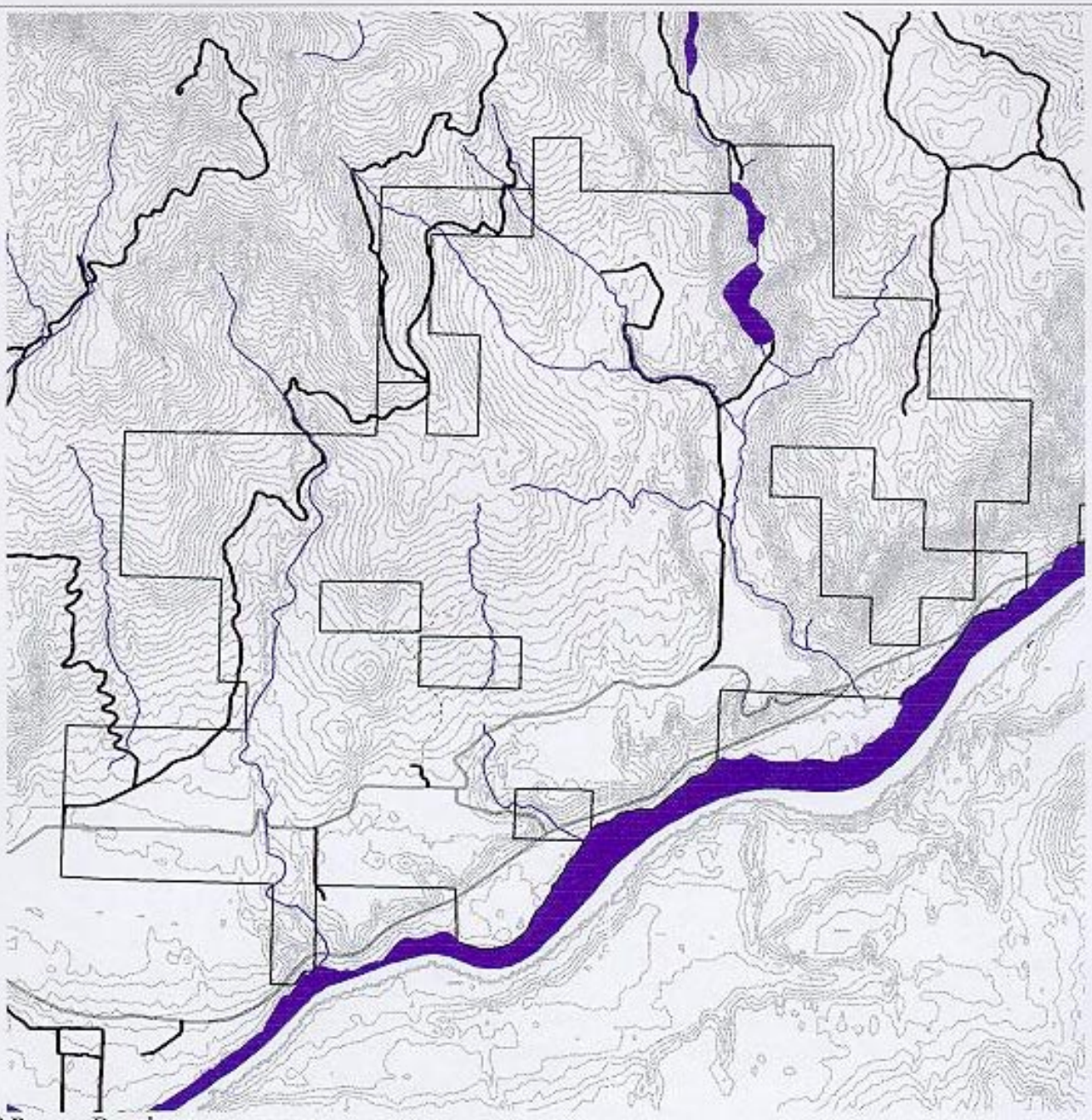
- Restore grassland habitat and promote healthy shrub stands of sage and bitterbrush on small acreage's of agricultural land.
- Protect, enhance and restore small segments of the riparian corridor along the intermittent creeks.
- Protect the area from livestock trespass by maintaining boundary fences.
- Improve current stands of sage and bitterbrush.
- Encourage Ponderosa pine regeneration on supporting soils and maintain.
- Create brush piles for small mammals in suitable areas.

Long-term Management Goals

- Manage the forest canopy characteristics of the P. pine for optimum habitat conditions on this unit.
- Increase the size and diversity of the riparian and riparian shrub areas.
- Develop waterfowl brood rearing and nesting areas on mitigation lands along the river.

Monitoring and Evaluation Activities

- Wildlife population trends and Habitat use will be monitored annually.
- Vegetative community composition, succession stage and associated changes will be documented.
- Noxious weed control applications will take place where necessary.
- Cultural and subsistence use of this unit will be monitored.

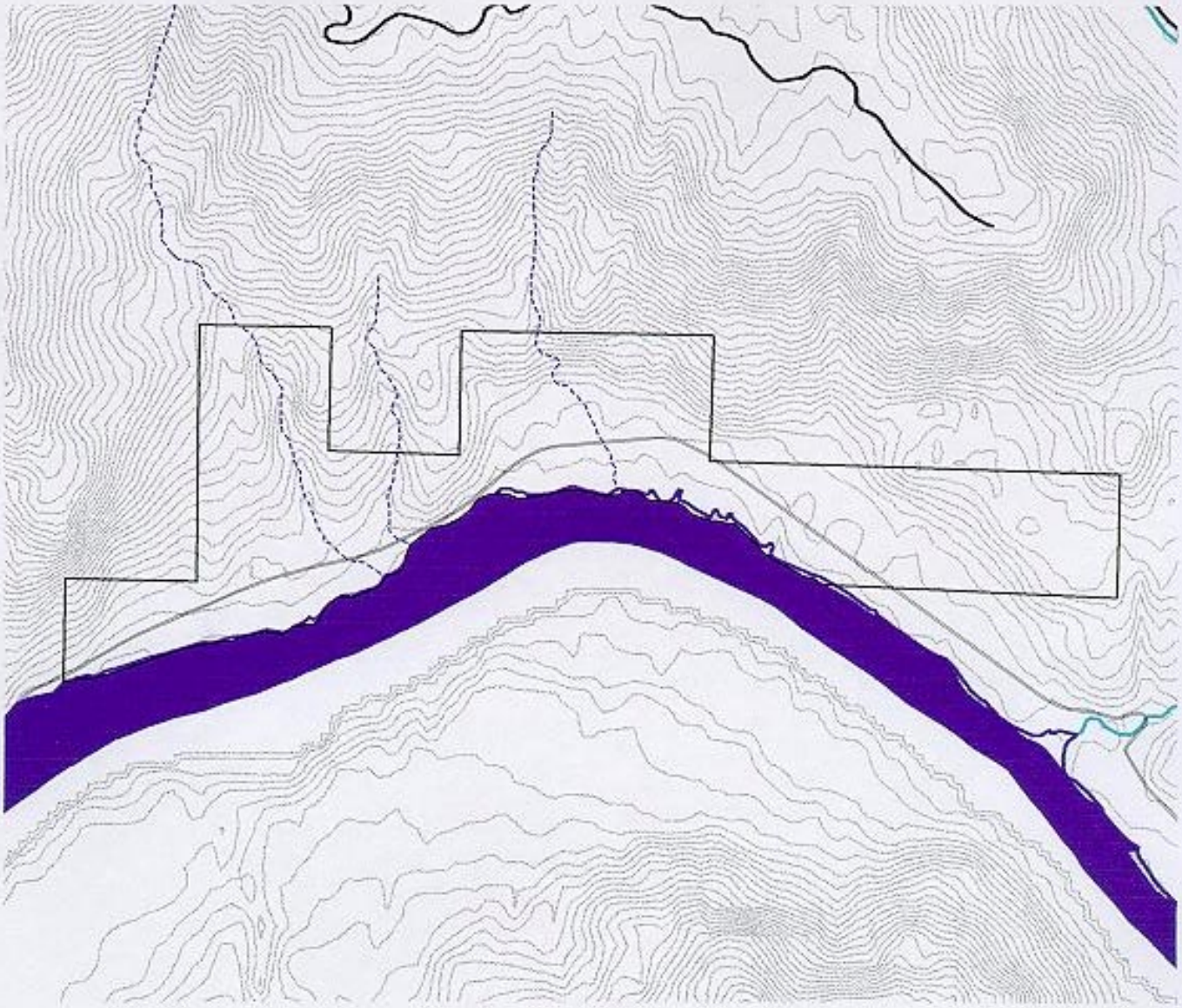


Property Boundary
Columbia River
Lakes
Streams (CCT types)
1
2
3
4

Berg Unit- Topography

Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Contours (40ft.[W])
Contours (40ft.[C])

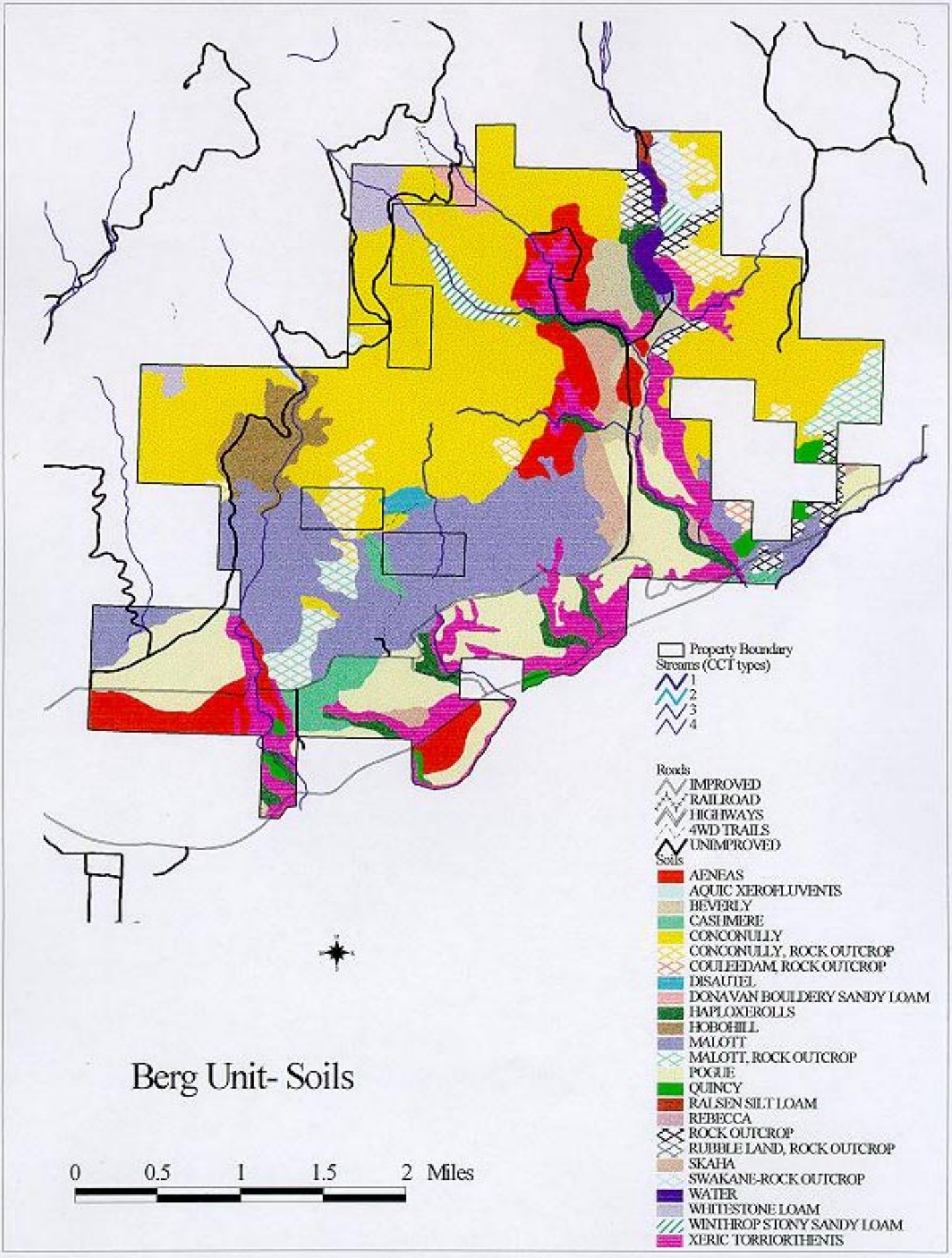
0 0.5 1 1.5 2 Miles

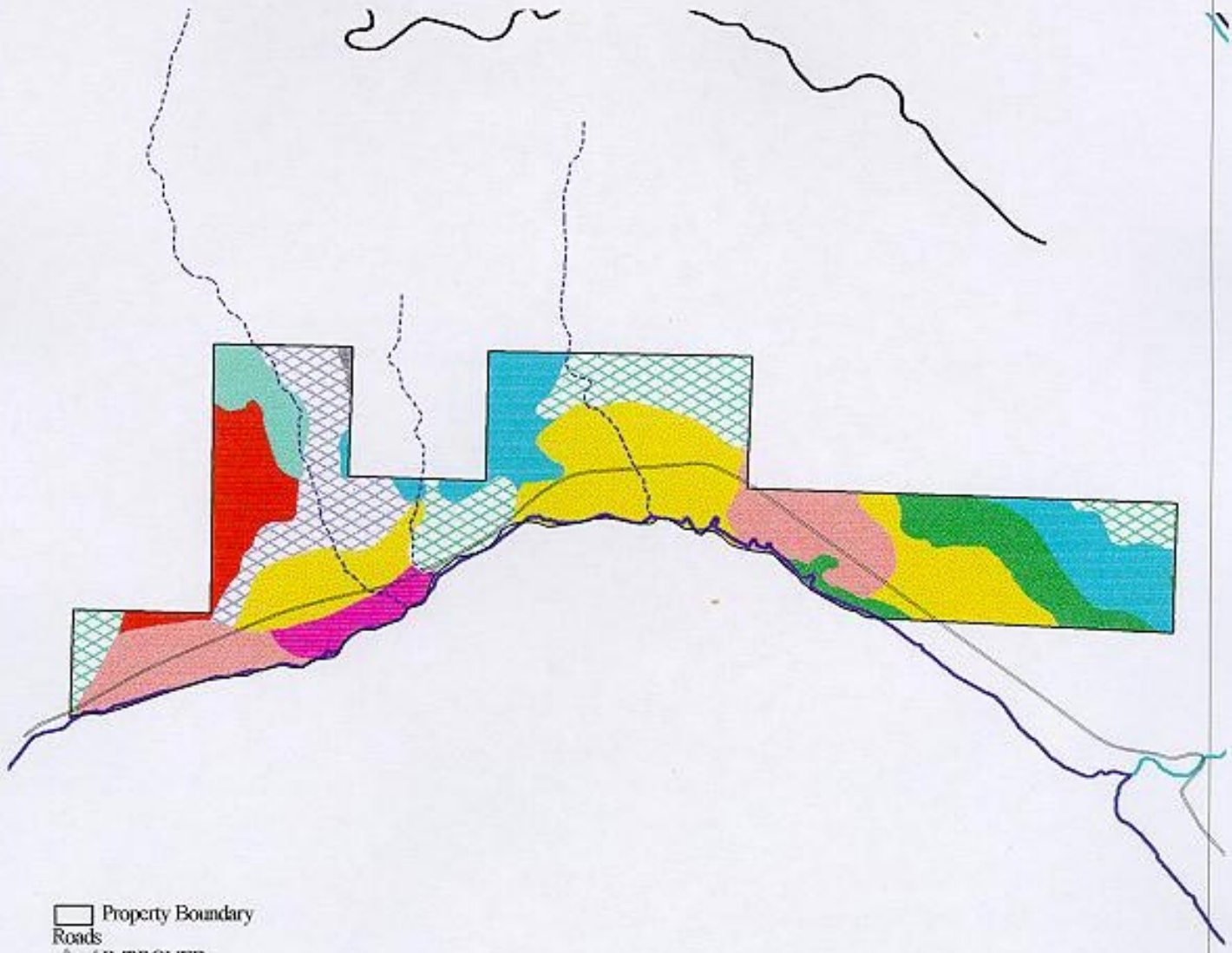


Property Boundary
Columbia River
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Contours (40ft.[C])

Nespelem Bend Unit- Topography

0 0.2 0.4 0.6 0.8 1 Miles


Property Boundary
Streams (CCT types)
1
2
3
4
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Soils
AENEAS
AQUIC XEROFLUVENTS
BEVERLY
CASHMERE
CONCONULLY
CONCONULLY, ROCK OUTCROP
COULEEDAM, ROCK OUTCROP
DISAUTEL
DONAVAN BOULDERY SANDY LOAM
HAPLOXEROLLS
HOBOHILL
MALOTT
MALOTT, ROCK OUTCROP
POGUE
QUINCY
RAISEN SILT LOAM
REBECCA
ROCK OUTCROP
RUBBLE LAND, ROCK OUTCROP
SKAHA
SWAKANE-ROCK OUTCROP
WATER
WHITESTONE LOAM
WINTHROP STONY SANDY LOAM
XERIC TORRIORTHENTS
Berg Unit- Soils
0
0.5
1
1.5
2 Miles



Property Boundary

Roads
- IMPROVED
- RAILROAD
- HIGHWAYS
- 4WD TRAILS
- UNIMPROVED

Streams (CCT types)
- 1
- 2
- 3
- 4

Soils
- CASHMERE
- CONCONULLY
- CONCONULLY, ROCK OUTCROP
- COULEEDAM, ROCK OUTCROP
- MALOTT
- MALOTT, ROCK OUTCROP
- POGUE
- QUINCY
- SKAHA
- XERIC TORRIORTHENTS

Nespelem Bend Unit- Soils

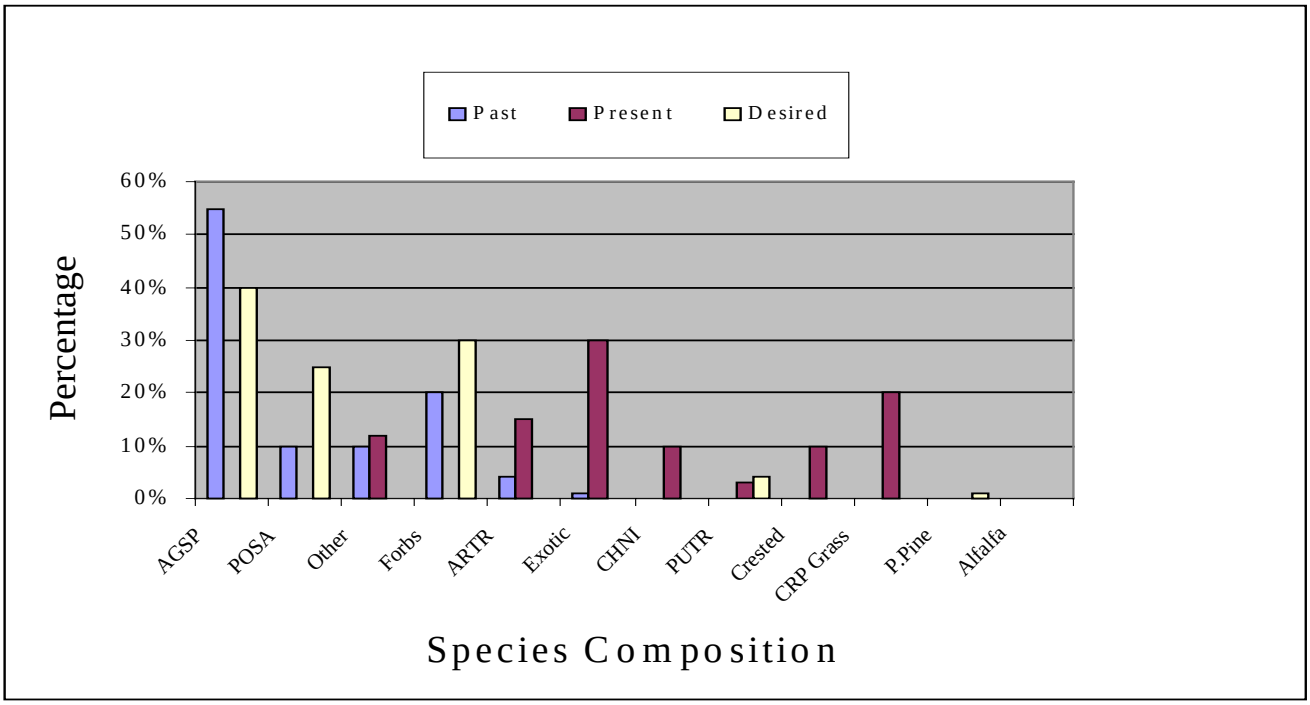
0 0.2 0.4 0.6 0.8 1 Miles

- Habitat component abundance and use (cavities, snags, etc.,) will be evaluated by HEP.
- HEP was done in 1997 for baseline data, the next HEP is scheduled for 2002.

GRASSLAND COVER (3,108 acres)

This is a broad-based classification describing grass and forb covered areas with little or no trees and/or shrubs. The grasslands on this unit are mostly the ARTR/AGSP habitat type association located on Conconully and Malott soils. Conconully and Malott soils are stony fine sandy loams. Grazing on this unit has altered the grassland habitat. Over time invading species such as cheatgrass (*Bromus tectorum*) and the spread of rabbitbrush (*Chrysothamnus nauseosus*) has altered the grass and forb components. Fire has not played a big part in determining the present vegetative cover on these lands. Fire selects for the grasses and kills the shrubs establishing a grassland habitat composed mostly of grasses and forbs with few shrubs. The grasslands on this unit will be managed for the benefit of sharp-tailed grouse which also represents all those species using the grassland habitat type. Management actions will restore native grassland species such as bluebunch wheatgrass (*Agropyron spicatum*) and Sandberg's bluegrass (*Poa sandbergii*) with an abundance of perennial and annual forbs and reduce the Artemisia and Chrysothamnus shrub component to less than 30 percent of the entire area. These restored native-like grasslands will provide forage and cover for upland birds and spring and summer forage for mule deer. Enhancement efforts will take place over time in such a way that the enhanced areas will spread and connect forming a large grassland ecosystem covering the 3,000 acres of this cover type. Restoration efforts will protect and enhance habitat for species using the grassland habitat type and over time increase the diversity and abundance of plant and animal communities of this habitat. Inclusions of other cover types may be found within this grassland cover type creating an edge effect and supplying diversity to the grassland habitat. Sharp-tailed grouse and mule deer are the management species for this cover type on this unit. Sharp-tailed grouse rated an HSI of 0.4 and the mule deer rated an HSI of 0.2 for the same area. Figure 6 below is an example of the vegetation composition of this cover type past, present, and future for this management unit.

FIGURE 6. GRASSLAND VEGETATION HABITAT TYPES OF THE BERG UNIT.



Proposed Habitat Protection and Enhancement Activities

- Weed control (herbicide applications, biological, mechanical and hand pulling) within this cover type to slow the spread of noxious weeds.
- Planting of perennial vegetation to improve wildlife habitat values.
- Controlled burning of up to fifty acres /year to improve wildlife habitat values.
- Seed burned areas with perennial grasses and forbs then monitor success, reseed if necessary.

SHRUB-STEPPE COVER

These areas are covered with ARTR/AGSP and/or PUTR/AGSP, PUTR/ FEID habitat types (2,658 acres). Most of this shrub-steppe cover has been disturbed by past land practices and rabbitbrush /cheatgrass are present in abundance and dominate several areas. This cover type occurs across areas containing former settlements, which used the land to produce dryland wheat or other cereal grain crops. When these areas stopped producing, the land was sold and/or used for cattle production. There are a number of different soils supporting the vegetative cover on this unit. They include xeric torriorthents, Shaka, Beverly, Coulee dam, Quincy, Aneas, Malott, Conconully and Hobohill associations. These soils are all mostly deep, well-drained sandy loam; some contain stony gravel or occur on steep slopes. These soils lack moisture, allowing semi-arid species of grass, forb and shrubs to occur as cover vegetation. Annual grasses and forbs, noxious weeds and exotic plant species have increased due to the influence of grazing. Sharp-tailed grouse and mule deer both rated an HSI of 0.3 and are the management species for this cover type. Figure 7 below is an example of the vegetation composition of this cover type past, present, and future for this management unit.

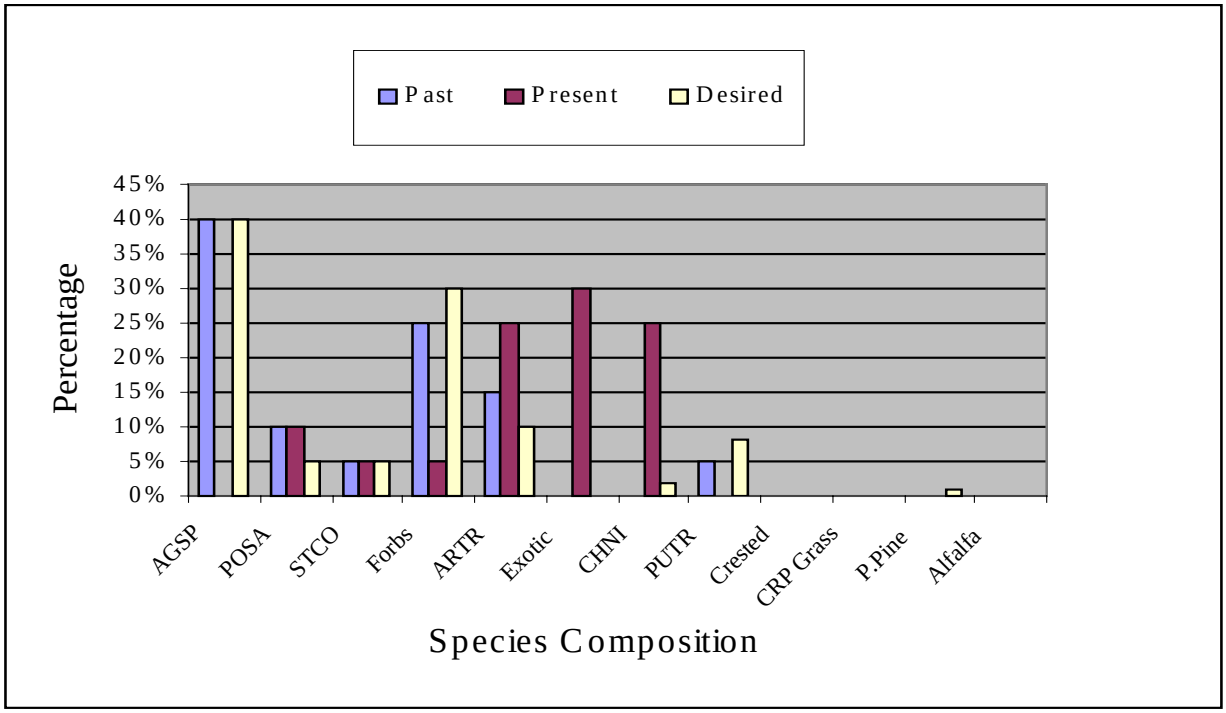


FIGURE 7. SHRUB-STEPPE VEGETATION HABITAT TYPES OF THE BERG UNIT.

Proposed Habitat Protection and Enhancement Activities

- Weed control (herbicide applications, biological, mechanical and hand pulling) within this cover type to slow the spread of noxious weeds.
- Planting of perennial vegetation to improve wildlife habitat values.
- Controlled burning of selected areas and planting desired shrubs/forbs to improve wildlife habitat values.

AGRICULTURAL LAND COVER

These lands (547 acres) were all ARTR/AGSP or PUTR/AGSP habitat type associations converted to grow agricultural crops such as alfalfa or grain and were periodically grazed after harvest. This totally changed the composition from native species to planted crops, invading annuals and a few native species competing for space and available moisture on these well-drained soils. The soils found within this cover type are Aneas, Pogue and Chasmere and are all deep, fine-grained, sandy loam. These soils make good farmland with the addition of water. This cover type will be converted back to grassland or shrub-steppe cover, depending on the habitat types, and managed for sharp-tailed grouse. The plant composition for this cover type consists of the following species and their relative abundance past, present and future. Sharp-tailed grouse were used to evaluate this cover type which rated an HSI of 0.2. Historically the area supported an abundance of sage and sharp-tailed grouse as well as other grassland/ shrub dependant species. Figure 8 below is an example of the vegetation composition of this cover type past, present, and future for this management unit.

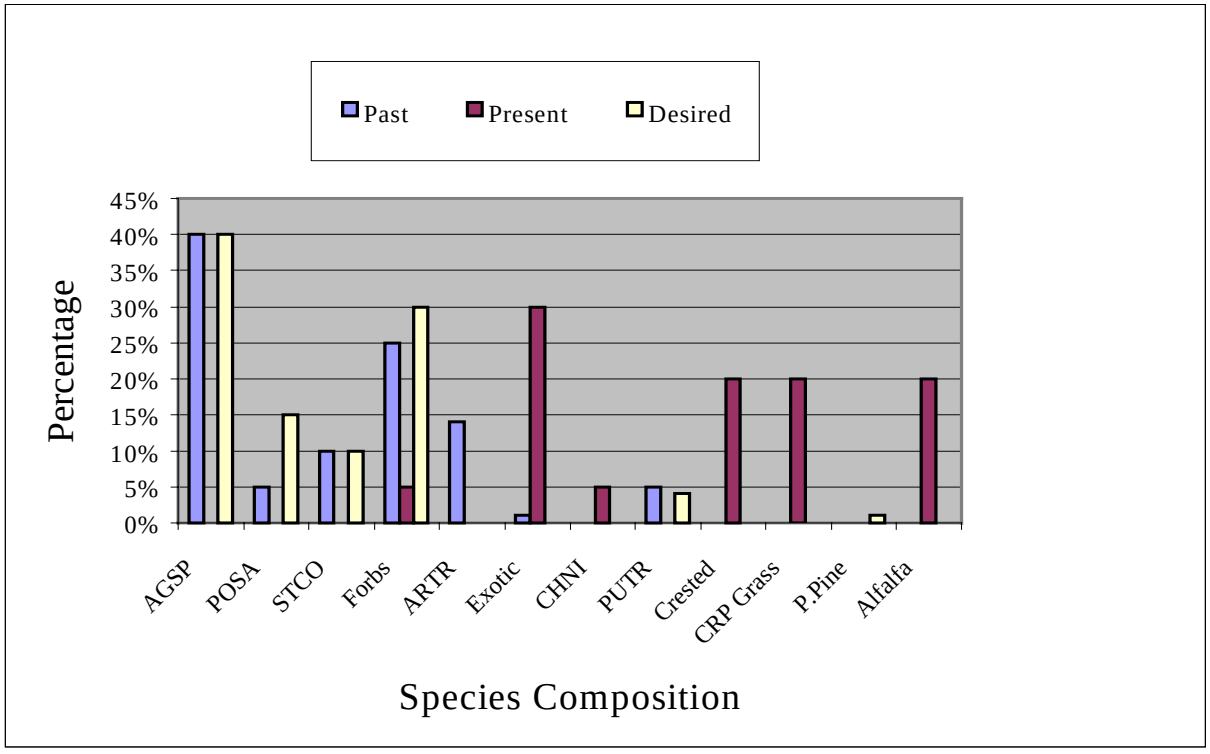


FIGURE 8. AGRICULTURAL VEGETATION HABITAT TYPES ON THE BERG UNIT.

Proposed Habitat Protection and Enhancement Activities

- Irrigated and non-irrigated wildlife food plot establishment and cultivation to improve wildlife winter food sources in the short term.
- Conversion of pasture and croplands to desired wildlife habitat (grassland and shrub-steppe).
- Controlled burning to improve wildlife habitat values.
- Restoration of small seeps and/or springs to support additional riparian vegetation and provide wildlife water sources.

CONIFER WOODLAND COVER

The Ponderosa pine stands (150 acres) will be managed to promote large widely spaced trees over shrubs and/or desired grasses and forbs. The Lewis' woodpecker was used to evaluate this habitat type on this management unit. The habitat rated an HSI of 0.2 due to the lack of large snags and understory vegetation. Management efforts will focus on developing snag habitat and increasing the desired understory vegetation. Future management actions will maintain the overstory Ponderosa pine as an uneven aged stand with a minimum of 2 large snags per acre.

SHORELINE COVER

This cover type (20 acres) is directly effected by hydropower operations, which change the water levels along the shoreline. High water releases flood shoreline areas inundating habitat and low water levels leave large exposed areas devoid of food and cover. Canada goose was used to evaluate this cover type which rated an HSI of 0.2, due to lack of nesting and brood rearing requirements for this species. Management for this cover type will be limited by hydropower operations and target flows. Selected areas above the high water mark will be planted for brood pastures with desired grasses and forbs. Goose tubs may be erected in suitable locations along the shoreline to increase nesting areas for this species.

RIPARIAN-SHRUB COVER

This cover type (32 acres) describes areas comprised predominately of hydrophytic shrubs in a riparian zone. Trees and/or shrubs found within this cover type are hawthorn, cottonwood, aspen, alder, water birch, red-osier dogwood, and willow. This is an important cover type for nesting neo-tropical birds, small mammals, and for deer fawning and feeding cover. Productivity is high due to species diversity and quality of available habitat. The cover type on this unit rated an HSI of 0.2 for Yellow warbler because of limited tree/shrub crown cover and low percent of hydrophytic shrubs within the overall shrub canopy. Livestock use of these areas over the last sixty years has lowered the productivity and eliminated a number of desired shrub species. Yellow warbler was and will be the management species for this cover type. Management activities to increase the amount and quality of hydrophytic shrubs and associated forbs include planting various hydrophytic shrubs along stream corridors thereby increasing the habitat for Yellow warblers and all riparian-shrub species. The riparian-shrub cover will be kept at a low to mid seral stage to favor these wildlife species.

RIPARIAN COVER

This cover type (136 acres) is described as vegetation adjacent to aquatic systems. Riparian cover begins at the high water mark and extends to that portion of the landscape that is influenced by, or that directly influences, the aquatic ecosystem. This includes floodplains. This cover type is similar to the one above in respect to tree/shrub species but also includes a

variety of emergent vegetation. This cover type can be the most productive habitat for wildlife because most species depend on water. Most of this cover type has been altered by past land use and grazing impacts. Management will focus on eliminating the cause of the decline. Mink was used for the HEP evaluation and rated an HSI of 0.2. Habitat conditions are improving now that livestock have been removed from this unit. Restoration will take place with supplemental planting of riparian dependant species to increase diversity and quantity.

ROCK COVER

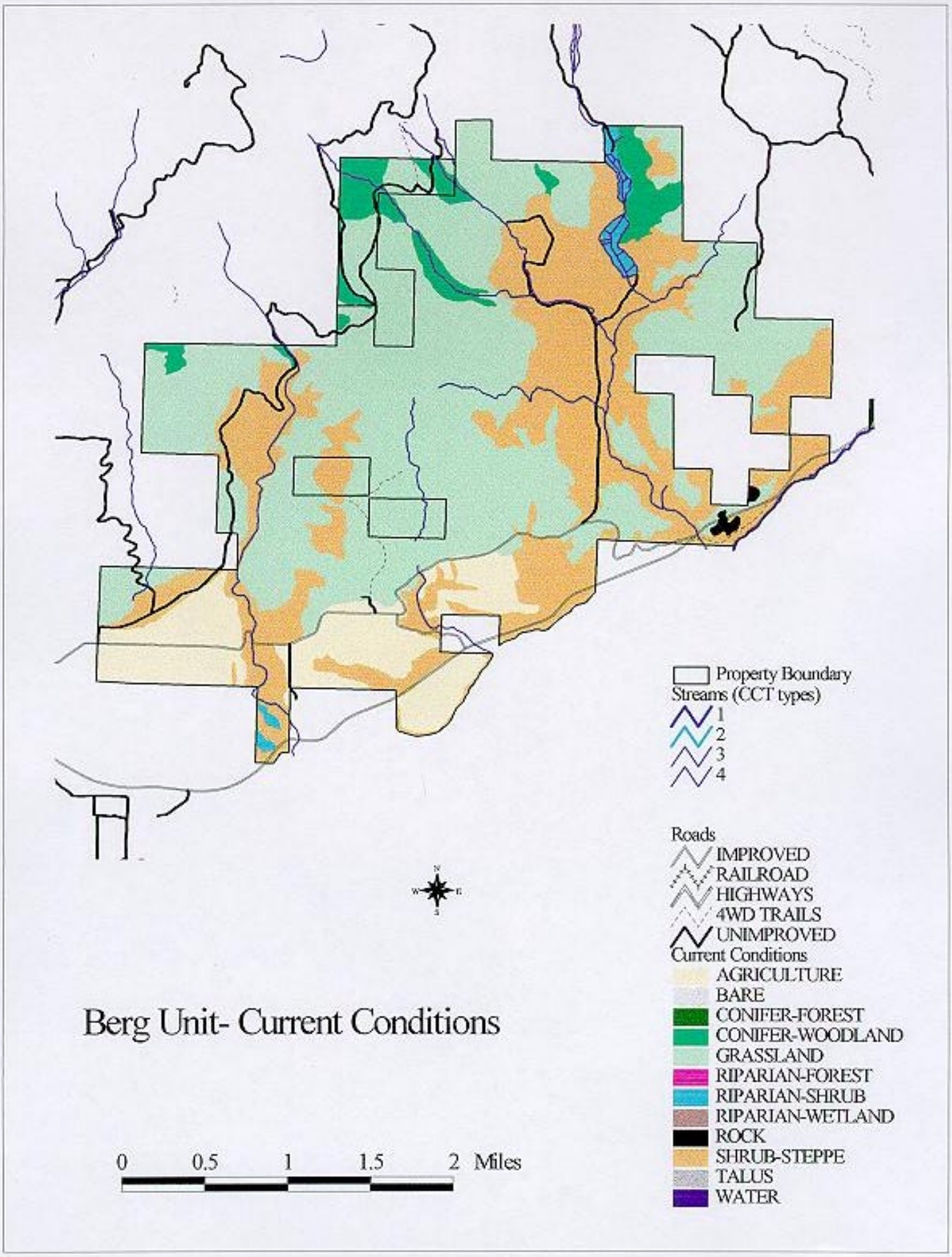
This cover type (185 acres) occurs mostly on the Nespelem Bend area of the Berg unit and is basically shrub-steppe with the addition of rock outcrops. The rock areas do not support abundant forage or cover. However the immediate area surrounding the rock outcrops or individual rock forms a protected microenvironment containing more moisture throughout the year that supports vegetation found in wetter areas of the shrub-steppe habitat. The composition of this vegetation depends on depth of soil, soil types, moisture, and aspect. Management for this area includes increasing the number and kind of shrubs associated with this cover type excluding sage and bitterbrush. Restoration of the perennial grasses and forbs and reducing the undesirable species such as cheatgrass and noxious weeds is also planned. Bobcat was used to evaluate this cover type which rated an HSI of 0.6. Future management actions for this area will be to add where possible, more desired grasses, forbs and deciduous shrubs around the rocky outcrops. The enhancement of this cover type will provide feeding and hiding cover for a variety of wildlife species.

Table 9 describes the results of the baseline HEP study and possible future Habitat Units resulting from habitat protection without enhancements.

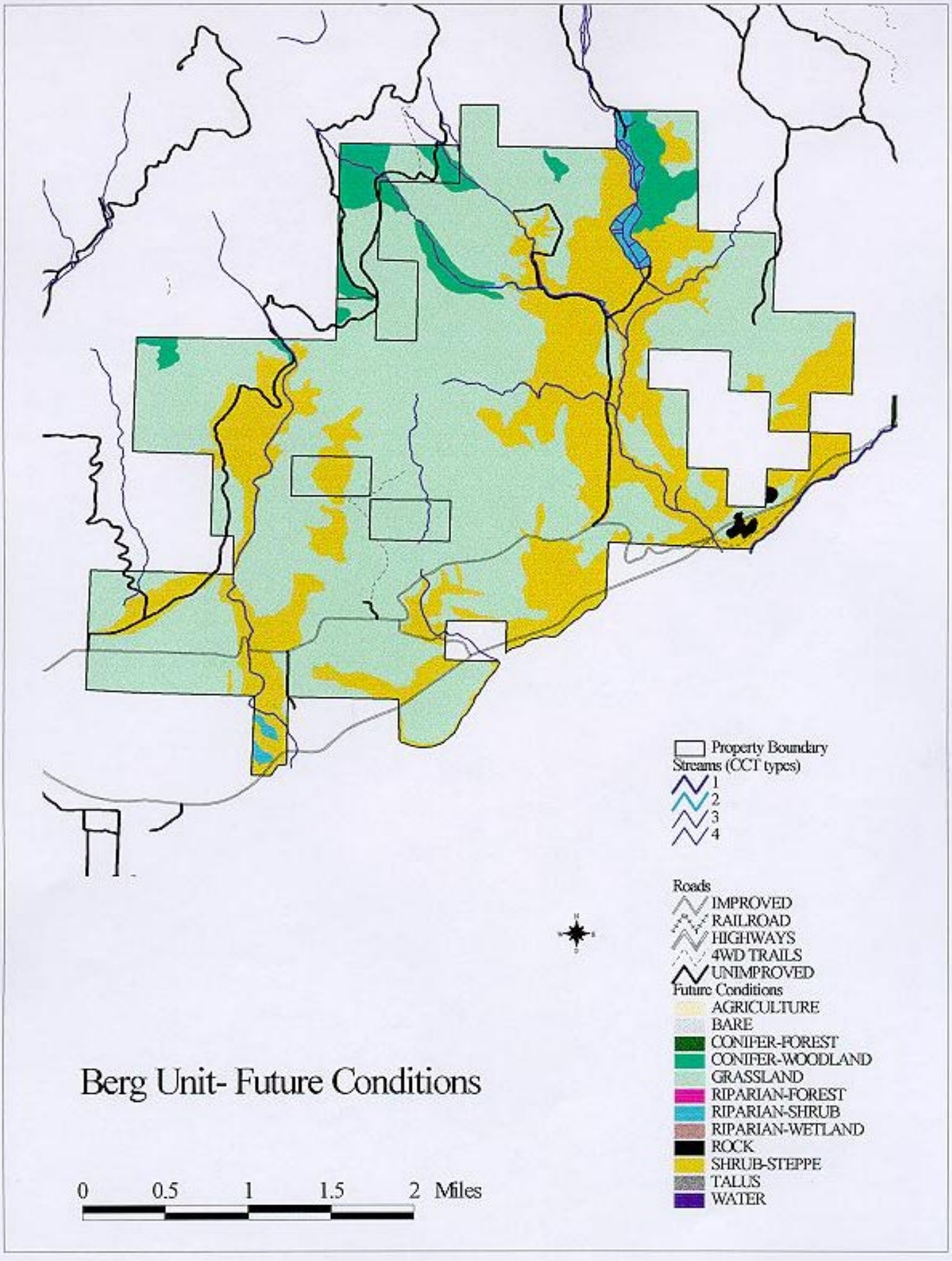
Table 9. Current and desired future cover types, HEP species and results for the Berg Unit.

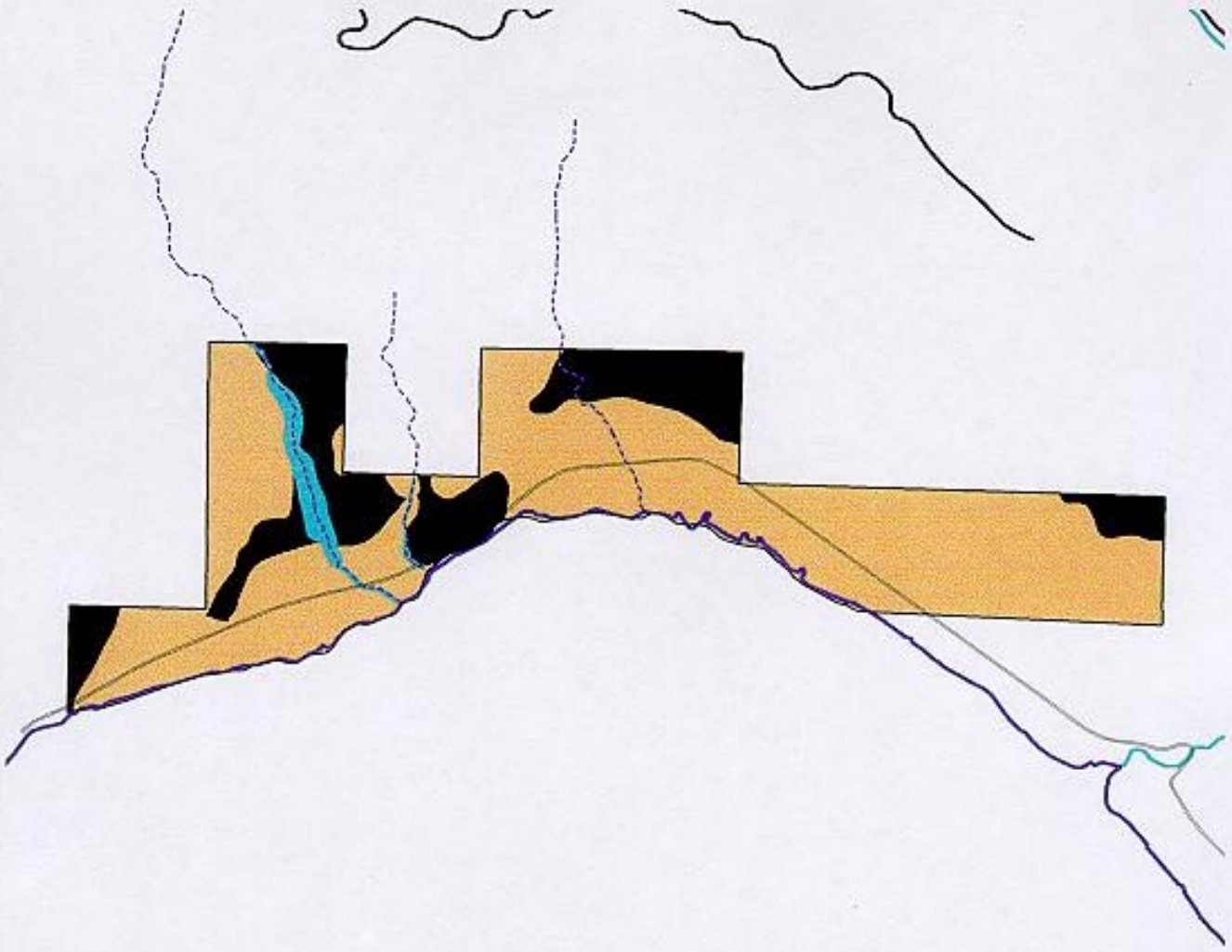
Cover Type	HEP Species	HSI	Acres	HU's
CURRENT CONDITIONS				
Grassland	Mule Deer	0.2	3,108	715
Grassland	Sharp-tailed Grouse	0.4	3,108	1,243
Agriculture	Sharp-tailed Grouse	0.2	547	109
Shoreline	Canada Goose	0.2	20	4
Conifer Woodland	Lewis' Woodpecker	0.3	150	30
Shrub-steppe	Sharp-tailed Grouse	0.2	2,402	721
Shrub-steppe	Mule Deer	0.3	2,659	798
Rock	Bobcat	0.6	185	111
Shrub Wetland	Yellow Warbler	0.4	32	13
Riverine	Mink	0.2	136	27
FUTURE CONDITIONS				
Grassland	Mule Deer	0.4	3,108	1,243
Grassland	Sharp-tailed Grouse	0.4	3,655	1,462
Shoreline	Canada Goose	0.3	20	6
Conifer Woodland	Lewis' Woodpecker	0.4	150	60
Shrub-steppe	Sharp-tailed Grouse	0.4	2,402	961
Shrub-steppe	Mule Deer	0.3	2,659	798
Rock	Bobcat	0.6	185	111
Shrub Wetland	Yellow Warbler	0.5	32	16
Riverine	Mink	0.5	136	68

The following Figures 9-12 show maps of the current and future conditions for this unit.



Berg Unit- Current Conditions


Property Boundary
Streams (CCT types)
1
2
3
4
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Future Conditions
AGRICULTURE
BARE
CONIFER-FOREST
CONIFER-WOODLAND
GRASSLAND
RIPARIAN-FOREST
RIPARIAN-SHRUB
RIPARIAN-WETLAND
ROCK
SHRUB-STEPPE
TALUS
WATER
Berg Unit- Future Conditions
0 0.5 1 1.5 2 Miles



Property Boundary

Roads
- IMPROVED
- RAILROAD
- HIGHWAYS
- 4WD TRAILS
- UNIMPROVED

Streams (CCT types)
- 1
- 2
- 3
- 4

Current Conditions
- AGRICULTURE
- CONIFER-FOREST
- CONIFER-WOODLAND
- GRASSLAND
- RIPARIAN-FOREST
- RIPARIAN-SHRUB
- RIPARIAN-WETLAND
- ROCK
- SHRUB-STEPPE
- TALUS
- WATER

Nespelem Bend Unit- Current Conditions

N
W E
S

0 0.2 0.4 0.6 0.8 1 Miles

Property Boundary

Roads
- IMPROVED
- RAILROAD
- HIGHWAYS
- 4WD TRAILS
- UNIMPROVED

Streams (CCT types)
- 1
- 2
- 3
- 4

Future Conditions
- AGRICULTURE
- CONIFER-FOREST
- CONIFER-WOODLAND
- GRASSLAND
- RIPARIAN-FOREST
- RIPARIAN-SHRUB
- RIPARIAN-WETLAND
- ROCK
- SHRUB-STEPPE
- TALUS
- WATER

Nespelem Bend Unit- Future Conditions

0 0.2 0.4 0.6 0.8 1 Miles

Bridge Creek Management Unit

This Unit contains 137 acres of various habitats. Highway 21 runs north and south through the property almost parallel to the Sanpoil River. Bridge Creek road running east and west intersects Hwy. 21 near the center of this unit (Figure 13). In the past, the land was periodically burned to eliminate succession by riparian tree/shrub species and maintain a pasture for horses. An abandoned residence near the junction of Highway 21 and Bridge Creek road was considered a public hazard. In 1995, the Tribes, BPA and Project personnel then removed the house. This unit requires about three miles of perimeter fencing. Project personnel repaired existing fences (1.25 miles) to prevent livestock trespass and started noxious weed control as the properties were purchased. The area on both sides of the river support wetland vegetation. This vegetation consists of limited stands of willow, aspen, cottonwood, alder, red-osier dogwood, cattails, sedges, etc. The higher areas adjacent to the wetlands are dryer and support Douglas fir, Ponderosa pine, snowberry, bitterbrush, grasses and forbs. HEP cover types on this unit include, conifer forest (8 ac.), mixed forest (8 ac.), shrub-steppe (15 ac.), grassland (25 ac.), deciduous (43 acres), and Riparian (38 ac.) (See current condition map). Species for management will include all wetland obligate wildlife species using the area and include mule and white-tailed deer, downy woodpecker, waterfowl, blue heron, Canada goose, mourning dove, bald eagle, ruffed grouse, otter and mink. This unit protects a portion of wildlife habitat along the Sanpoil River from urban development or conversion to agricultural use. This small unit is surrounded by private property and bisected by major roads. Larger tracts of similar habitat are needed to prevent isolation or fragmentation of certain wildlife species using this habitat. Future acquisition of additional land is needed to protect and create suitable habitat space for wildlife using this area. A screen of trees and shrubs planted along the roadsides will improve hiding and escape cover. Waterfowl and aquatic mammals make extensive use of the wetland areas. The Sanpoil river meanders through the unit east of Hwy 21and during peak flows (April and May) the entire lowlands flood. Bridge creek adds to the flooding and deposits large amounts of eroded sediment on the unit each spring. In 1996, deposition of sand and gravel from Bridge creek covered the four-foot boundary fence along a fifty-foot section where the creek enters the unit. West of Hwy 21 the land is covered by riparian shrub, mixed forest and grassland vegetation. The grassland vegetation contains annual and perennial grasses, noxious weeds, and forbs. Shrubs include bitterbrush, rose, serviceberry, chokecherry, snowberry and Oregon grape. Trees include birch, Hawthorne, aspen, fir and pine.

Soils

The soils, derived from weathered bedrock and glacial ground materials, are sandy loam (Figure 14). These soils vary in composition but all are well drained and this determines the type and amount of vegetative cover. In the past, prior to human disturbance the area was probably an aspen seral stage of the Douglas fir cool moist climax (DFCM).

Management Goals for this unit

Prevent livestock trespass and allow succession towards the aspen seral stage of the DFCM climax.

Short-term Management Goals

- Prevent livestock trespass on this unit.
- Maintain the boundary fences and construct new fences where needed.

- Continue noxious weed control on the unit.
- Allow the meadow areas to return to deciduous hardwoods.
- Support the growing of hardwoods in the riparian and upland areas.

Long-term Management Goals (see Figure 16):
- Increase the amount of Cottonwood, birch, willow and aspen stands on this unit.
- Maintain the open areas as meadow grasslands.
- Enhance and restore understory species within the riparian corridor along the river.
- Maintain and enhance the understory vegetation such as snowberry and rose west of Highway 21.
- Protect and enhance fish habitat at the mouth of Bridge creek.
- Plant selected deciduous trees and/or shrubs to add diversity.
- Monitor successional changes over time and add beaver to restore natural ecosystem processes.
- Plant a screen of trees/shrubs along the roads for hiding cover for wildlife.

Monitoring and Evaluation Activities:
- Wildlife population trends and Habitat use.
- Document the changes to the vegetative community composition, succession stage and collect photo points within each representative habitat type.
- Document noxious weed control applications and results.
- Document any cultural or subsistence resource use by Tribal members.
- Monitor and collect habitat data on component abundance and use (cavities, snags, etc.,).

SHRUB-STEPPE COVER (15 acres):
This area was cover typed as shrub-steppe because of the presence of bitterbrush and grasses as the dominant species (Figure 15). These species are the result of past land use and semi-arid conditions. Ponderosa pine and hardwoods will replace the present vegetative cover and without disturbance should climax as a Douglas fir climax community. The Mule deer model was used to evaluate this cover type. This area will change over time through management, becoming mixed forest cover type and support riparian and upland vegetation such as serviceberry or chokecherry.

FORESTED WETLAND (8 acres) and CONIFER FOREST COVERS (8 acres)
These cover types contain deciduous and conifer species on the upland areas along the riparian corridor. The deciduous tree species are moisture dependent and occur where ground water is sufficient to support them. On dryer sites larch and Ponderosa pine occur as seral overstory trees. The climax habitat type for this area is Douglas fir/ snowberry with a component of aspen. Downy woodpecker was the HEP species chosen for this cover type.

RIVERINE COVER (38 acres):
The riverine area was characterized as habitat adjacent to aquatic systems. It begins at the high water mark and extends to that portion of the landscape that is influenced by, or that directly influences, the aquatic system. This area is the floodplain for the Sanpoil River and Mink was chosen for the HEP analysis. The area rated low because it lacked cover. Cover furnished by

vegetation and structural diversity provides shelter and habitat for prey species as well as foraging and security cover for mink. Relatively dense vegetative cover must be present within this cover type to provide maximum prey diversity, cover and foraging opportunities for mink. Protection and enhancement of this cover type will increase the number of riparian obligate species as well as protect and enhance fish rearing habitat in the river.

GRASSLAND COVER (25 acres):
This cover type occurs here because of grazing. The normal habitat type without disturbance would be the DFWM habitat type. This grassland cover type does not belong in this location even though the sandy soils will support grasses and seral overstory Ponderosa pine trees. The natural habitat for this area is Douglas fir / snowberry association. Without disturbance the area will return to a Douglas fir / snowberry climax type or a stand of hardwoods (Quaking aspen seral stage) with associated vegetation. The Mourning dove model was chosen to evaluate this cover type in the HEP analysis. This area rated low for this species because it lacked food and cover requirements.

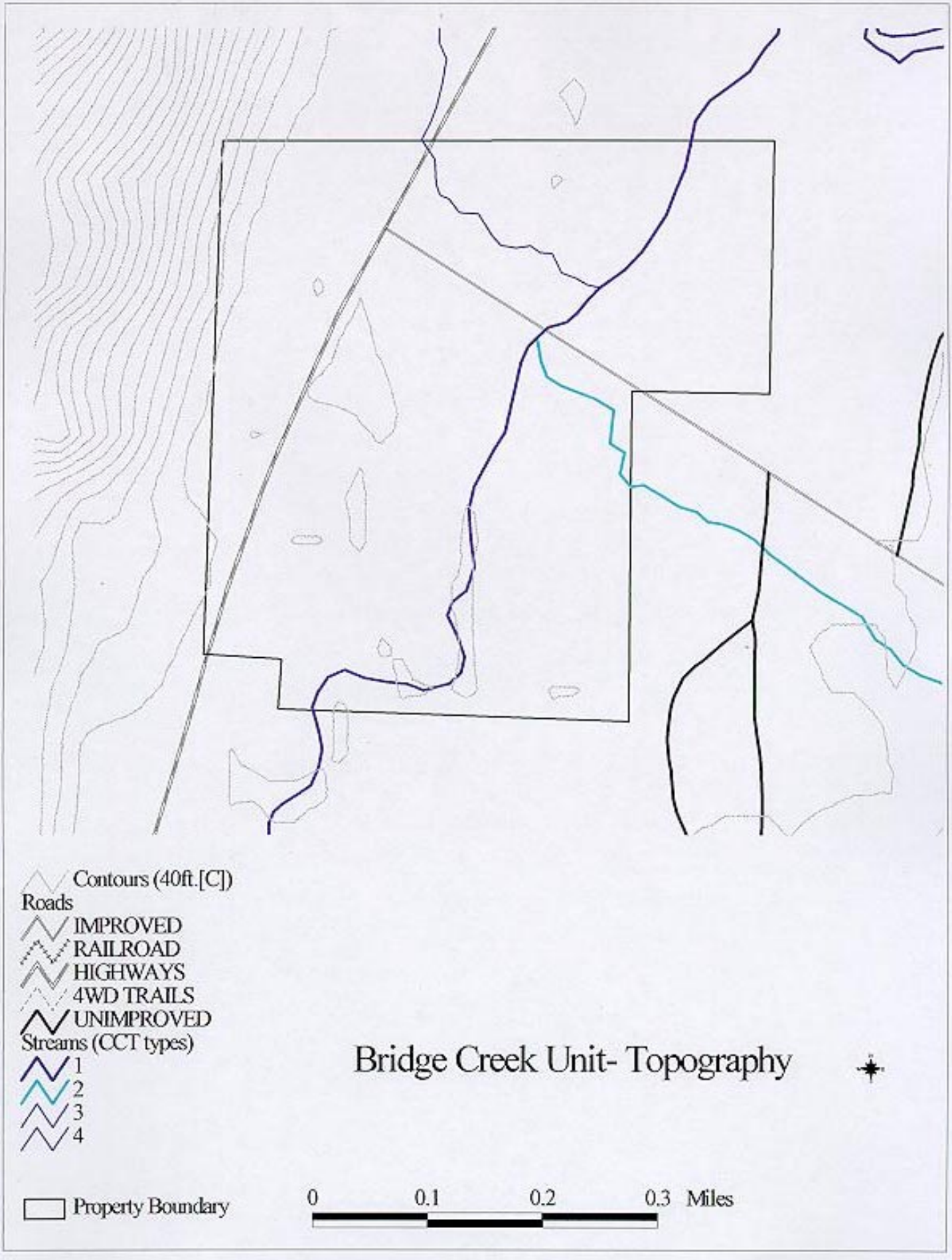
SHRUB WETLAND COVER (43 acres):
This habitat type is found east of highway 21 and south of Bridge creek road. The habitat has been disturbed by past land uses reducing species composition and number. The Yellow warbler was used to evaluate this habitat type which rated low (0.3). The area lacked diversity such as stands of deciduous shrubs composed of willow, birch, alder and cottonwood to satisfy all the life requirements for this species. Table 10 below describes the results of the baseline HEP study and possible future Habitat Units resulting from habitat protection without enhancements.

Table 10. Current and desired future cover types, HEP species and results for the Bridge Creek Unit.

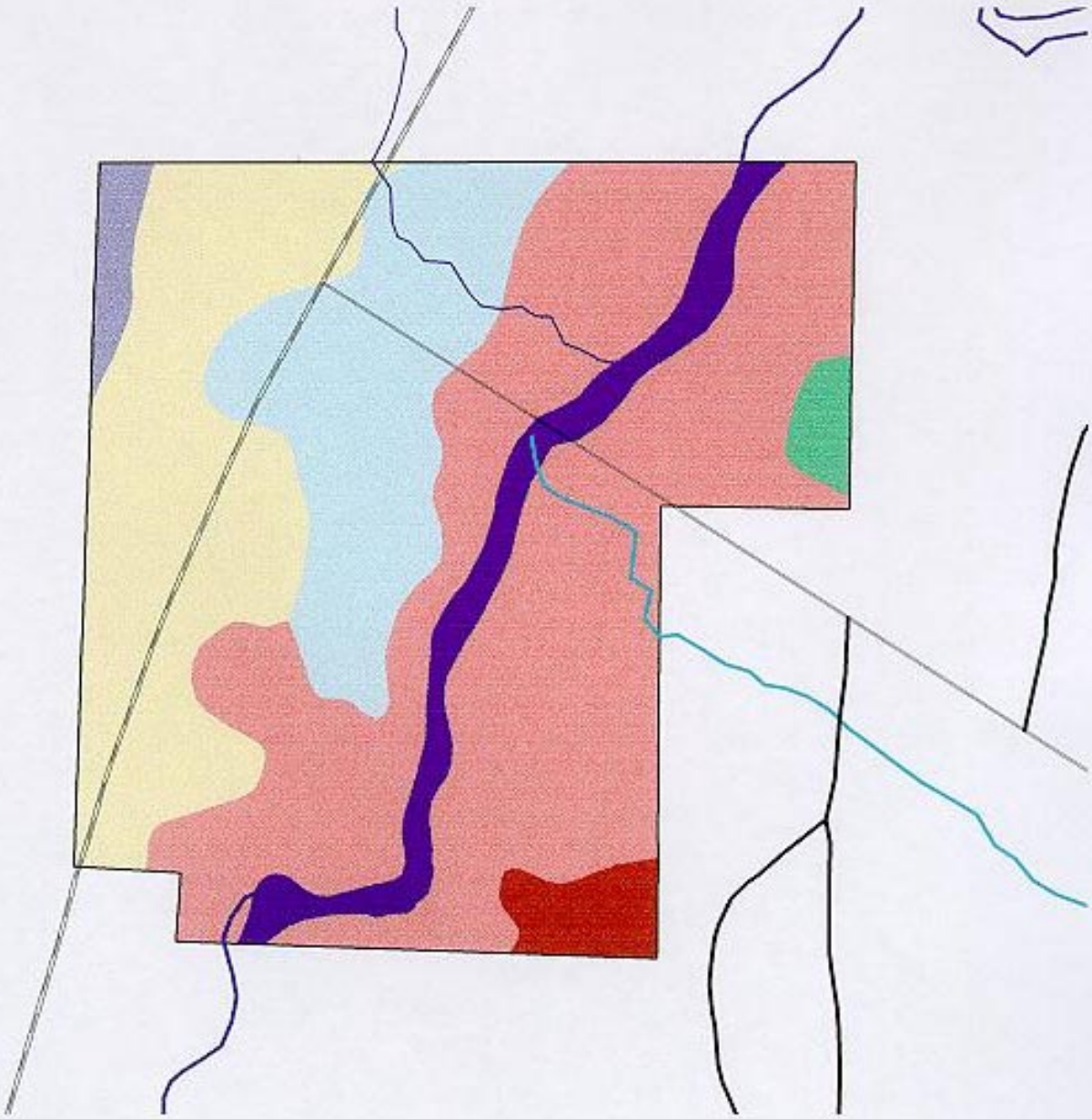
Cover Type	HEP Species	HSI	Acres	HU's
CURRENT CONDITIONS				
Grassland	Mourning Dove	0.5	25	12
Mixed Forest	Downy Woodpecker	0.8	8	6
Conifer Forest	Downy Woodpecker	0.8	8	6
Shrub-steppe	Mule Deer	0.3	15	4
Shrub Wetland	Yellow Warbler	0.3	43	13
Riverine	Mink	0.2	136	27
FUTURE CONDITIONS				
Grassland	Mourning Dove	0.5	25	12
Mixed Forest	Downy Woodpecker	0.8	8	6
Conifer Forest	Downy Woodpecker	0.8	8	6
Shrub Wetland	Yellow Warbler	0.5	58	29
Riverine	Mink	0.5	136	68

Management actions to reach the desired future conditions include converting the agricultural land to grassland and allowing the riparian shrub to replace the shrub-steppe areas within the

Sanpoil drainage. This would mean that wildlife using the riverine and shrub wetland cover would benefit from more acres of enhanced habitat. Future land development along the Sanpoil River means degraded or lost habitat for riparian obligate species, the Bridge creek unit will protect and enhance this unique habitat for wildlife for many years to come. The unit will also serve as a cornerstone or base in which to enlarge and expand riparian and riparian-shrub habitats to link other future land purchases along the Sanpoil river system.



Bridge Creek Unit- Topography

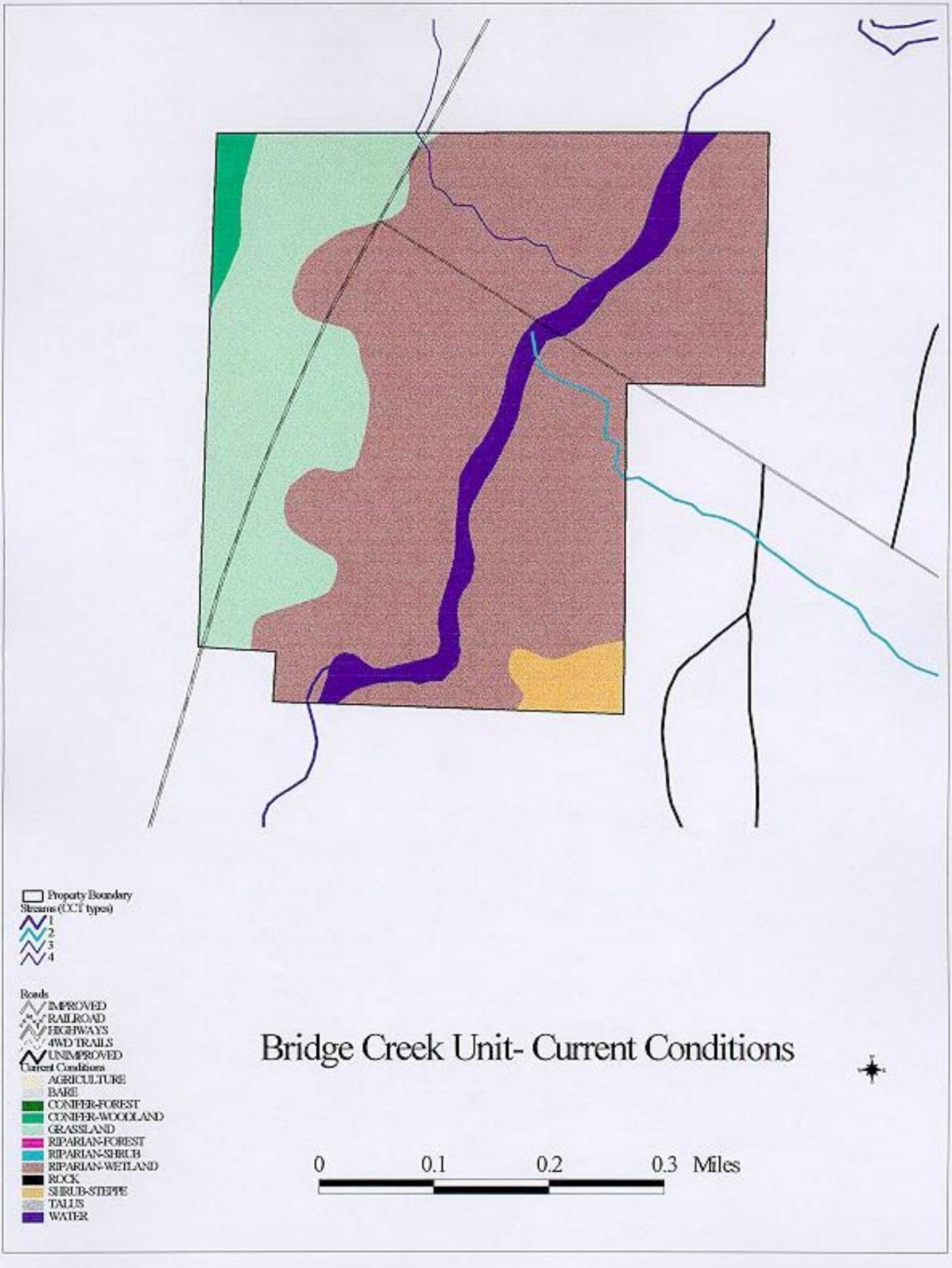


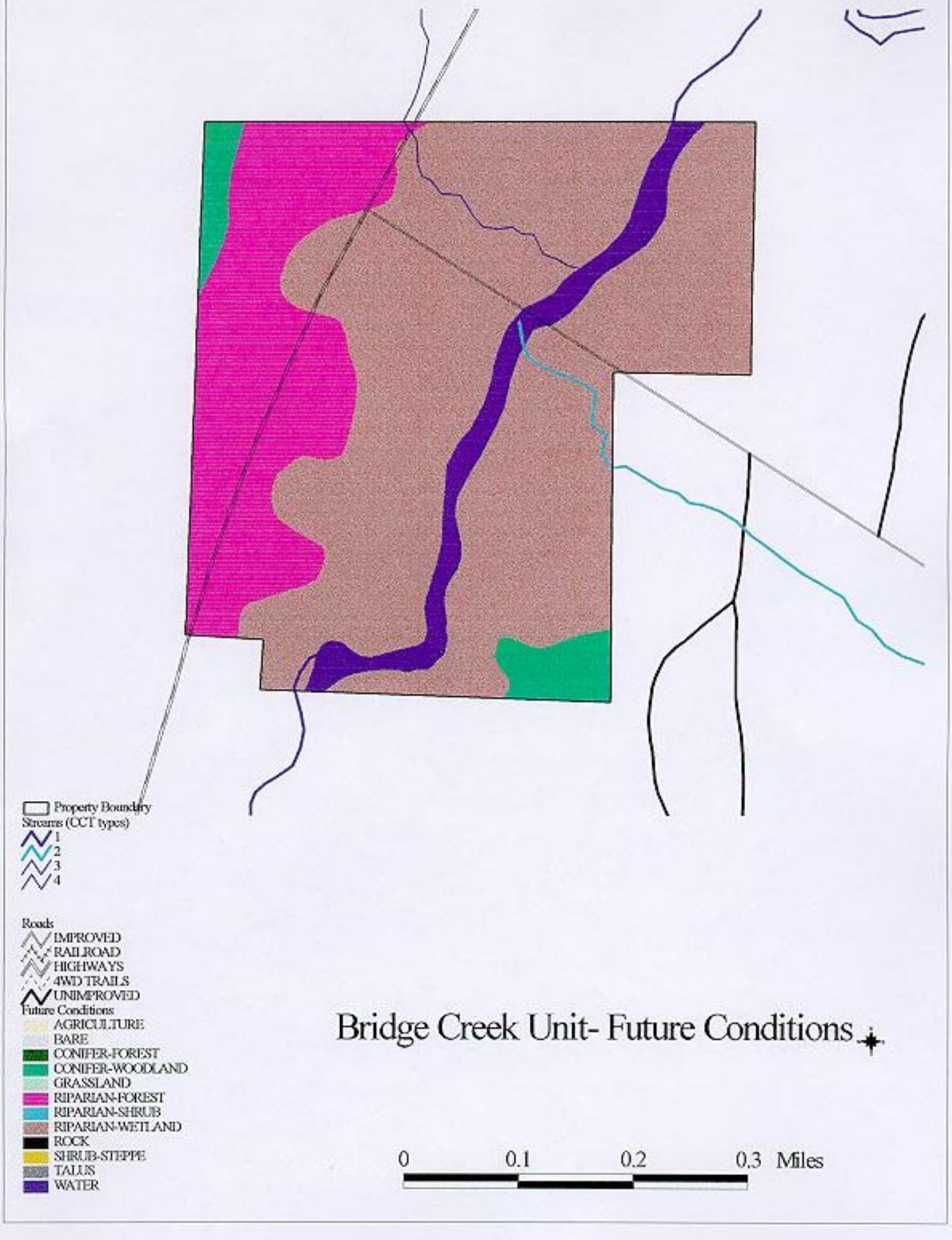
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4

Bridge Creek Unit- Soils

Property Boundary
Soils
AQUIC XEROFLUVENTS
CAPOOSE-ROCK OUTCROP COMPLEX
CUBCREEK FINE SANDY LOAM
HISTOSOLS
RET SILT LOAM
ROCK OUTCROP
SPRINGDALE GRAVELLY SANDY LOAM
WATER

0 0.1 0.2 0.3 Miles


Property Boundary
Streams (CCT types)
1
2
3
4
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Current Conditions
AGRICULTURE
BARE
CONIFER-FOREST
CONIFER-WOODLAND
GRASSLAND
RIPARIAN-FOREST
RIPARIAN-SHRUB
RIPARIAN-WETLAND
ROCK
SHRUB-STEPPE
TALUS
WATER
Bridge Creek Unit- Current Conditions
0
0.1
0.2
0.3 Miles


Property Boundary
Streams (CCT types)
1
2
3
4
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Future Conditions
AGRICULTURE
BARE
CONIFER-FOREST
CONIFER-WOODLAND
GRASSLAND
RIPARIAN-FOREST
RIPARIAN-SHRUB
RIPARIAN-WETLAND
ROCK
SHRUB-STEPPE
TALUS
WATER
Bridge Creek Unit- Future Conditions
0
0.1
0.2
0.3 Miles

Silver Creek Management Unit

This is the largest unit in the Hellsgate Reserve and is composed of three separate land parcels acquired from H. Kuehne in 1996. The former landowner's son operates a cattle ranch (approx. 125 acres) within the largest parcel that borders John Tom creek. The exact boundaries have not been established regarding this ranch. This Silver creek unit contains three parcels, totaling 1,583 acres, mostly coniferous forest cover type. John Tom creek runs from the east to the west across the southern portion of the property and contains 11 acres of riparian cover bordered by 65 acres enrolled in the Conservation Reserve Program (CRP). There are 312 acres of agricultural cover type that were used for hay and cereal grain production. Access to this parcel is through service roads north and south of John Tom creek and an old farm road in the north end of the parcel (Figure 17). The Hellsgate labor crew has mended and maintained most of the original boundary fence on the parcel, about 2 miles of new fence is needed to complete the boundary on the eastside. The middle parcel of this unit contains 240 acres of mostly coniferous forest and shrub-steppe habitat types with no major access roads. This parcel is on a high ridge above the Sanpoil River and is currently unfenced. The smallest parcel of this unit contains 80 acres of coniferous forest habitat type and has no direct access road to gain entrance to the parcel. It is also unfenced.

Soils:

The soils of this unit are mostly gravelly loam with scattered areas of rock outcrop complexes (Figure18). These soils support the PIPO habitat type with understory ARTR and/or PUTR and AGSP or CARU grasses. The areas used for agriculture have silt or sandy loam soil and occur in the valleys between ridges on the unit.

Management Goals for this unit:

Management of this unit involves constructing and maintaining boundary fences, preventing livestock trespass and controlling noxious weeds. Enhancement efforts will concentrate on restoring native and desired species to the different cover types. The major cover type will be conifer woodland with a mix of conifer forest and open shrub and/or grassland. The riparian corridor along John Tom creek will be enhanced and maintained.

Short-term management Goals:

- Construct new boundary fences for this parcel.
- Control noxious weeds.
- Seed the open areas to desired grasses and forbs.
- Enhance and restore the riparian corridor along the creek.
- Install gates on the access road at the entrance and end of the property to control access.

Long-term Management Goals:

- Convert the agricultural land to grassland and/or shrub-steppe.
- Maintain the CRP field for the duration of the contract.
- Enhance and maintain the riparian areas.
- Maintain both the conifer woodland and forest habitat types.

Monitoring and Evaluation Activities:

- Wildlife population trends and Habitat use.
- Vegetative community composition, succession stage and associated changes.
- Noxious weed control applications.
- Monitor cultural and subsistence use of the area.
- Inventory habitat component abundance and use (cavities, snags, etc.,).

GRASSLAND / AGRICULTURE COVERS (260 acres)
- Control noxious weeds and unwanted species.
- Plant suitable grasses and forb species for diversity, food and cover.
- Convert this cover type back to shrub-steppe and conifer forest.

CONIFER FOREST COVER (1,185 acres)
- Manage the plant association group on this unit for a mature Ponderosa pine dominated community.
- Maintain the overall canopy closure around 60% for mature trees.
- Maintain at least 6 snags per acre, 2 greater than 20" dbh.
- Work with Tribal Forestry to plan prescribed burns as necessary to grow big trees and reduce fuel loading in the understory.

RIVERINE COVER (11 acres)
- Plant suitable shrub and tree species along John Tom creek.
- Protect stream bank stability and increase the pool to riffle ratios along John Tom creek.
- Restore and enhance the understory vegetation along John Tom creek.

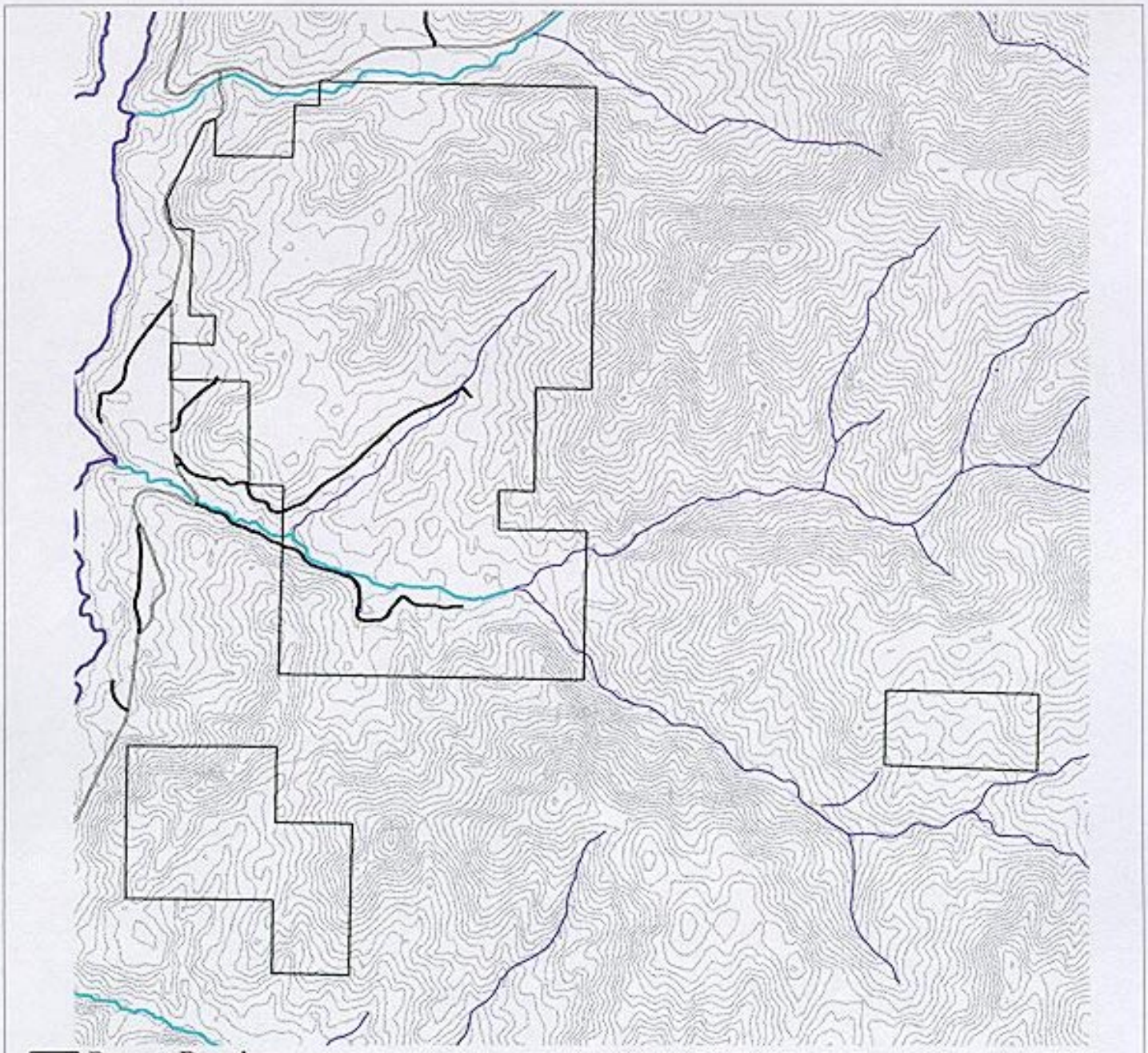
SHRUB-STEPPE COVER (40 acres)
This cover type occurs throughout this unit. The area was used as pasture for livestock and many of the grasses and forbs normally associated with this cover type are absent. The adjacent area was logged in the past and the disturbance altered the vegetative community. Noxious weeds especially knapweed, are prevalent over most of the area especially along the old skid trails.
- Maintain a mix of sage and bitterbrush patches at various life stages with associated understory grasses and forbs within the 40 acres of this cover type.
- Rejuvenate the old, decadent shrubs on 5 acres yearly and establish seedlings

CONIFER WOODLAND COVER (87 acres)
The area was logged in the past opening up the forest canopy and creating this cover type. Management plans for this area are to maintain the open Ponderosa pine woodland cover type with associated grass/forb understory vegetation.

Table 11. Current and desired future cover types, HEP species and results for the Silver Creek Unit.

Cover Type	HEP Species	HSI	Acres	HU's
CURRENT CONDITIONS				
Agriculture	Sharp-tailed Grouse	0.05	260	13
Conifer Woodland	Mule Deer	0.5	87	43
Conifer Forest	Downy Woodpecker	0.8	1,185	948
Shrub-steppe	Mule Deer	0.5	40	20
Riverine	Mink	0.3	11	3
FUTURE CONDITIONS				
Shrub-steppe	Mule Deer	0.6	195	117
Grassland	Mourning Dove	0.5	105	52
Conifer Woodland	Mule Deer	0.6	795	477
Conifer Forest	Downy Woodpecker	0.8	390	312
Riverine	Mink	0.5	15	7

The current conditions are drawn in Figure 19 for this unit. Management actions to reach the desired future conditions (Figure 20) include converting the agricultural land to grassland and shrub-steppe. The riparian area within the John Tom creek drainage will increase by 4 acres. The conifer woodland habitat would increase to benefit mule deer using the area as winter range. Maintaining a diversity of grasses and forbs under palatable sage and bitterbrush shrub species will enhance the shrub-steppe areas.



Property Boundary

Roads

IMPROVED

RAILROAD

HIGHWAYS

4WD TRAILS

UNIMPROVED

Streams (CCT types)

1

2

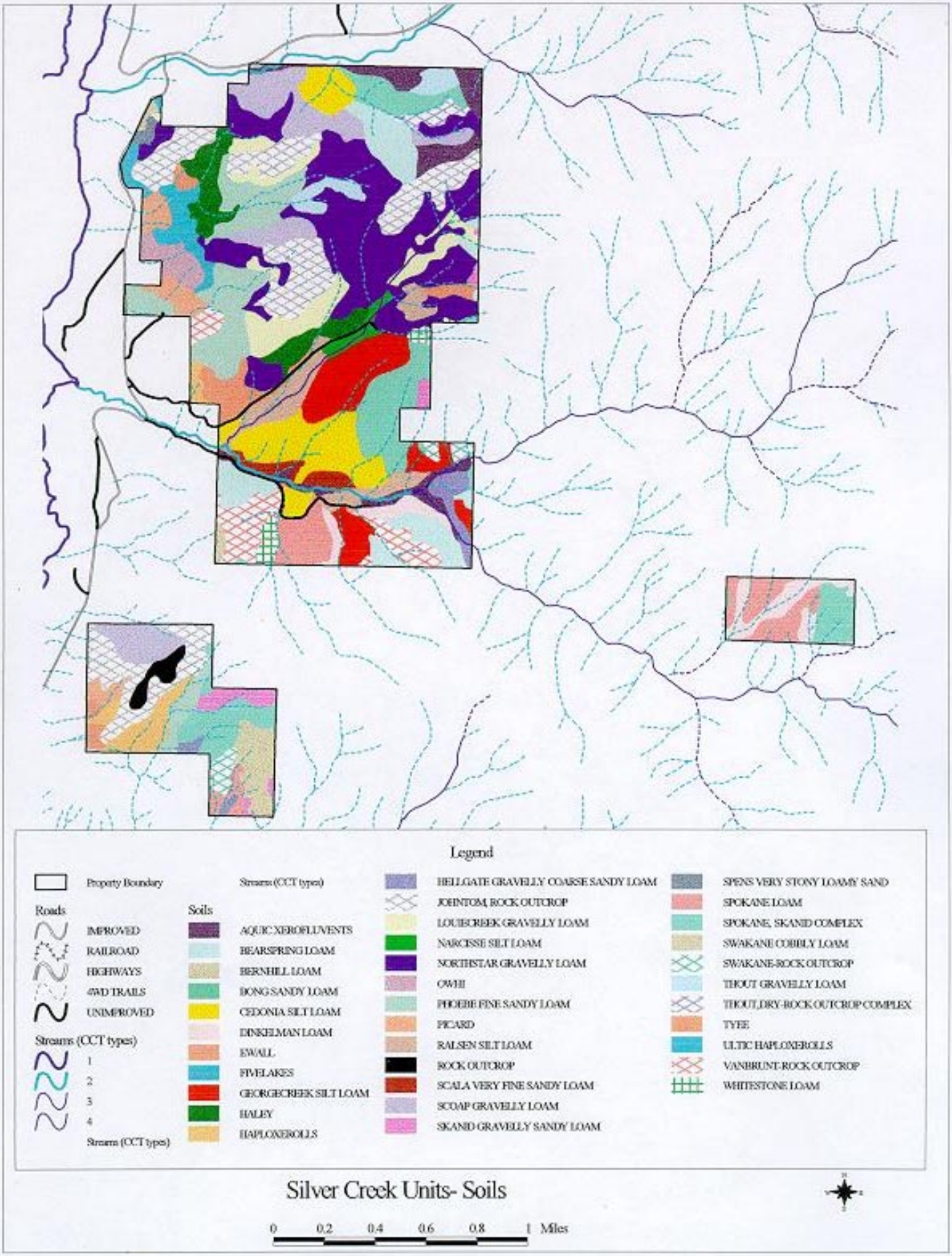
3

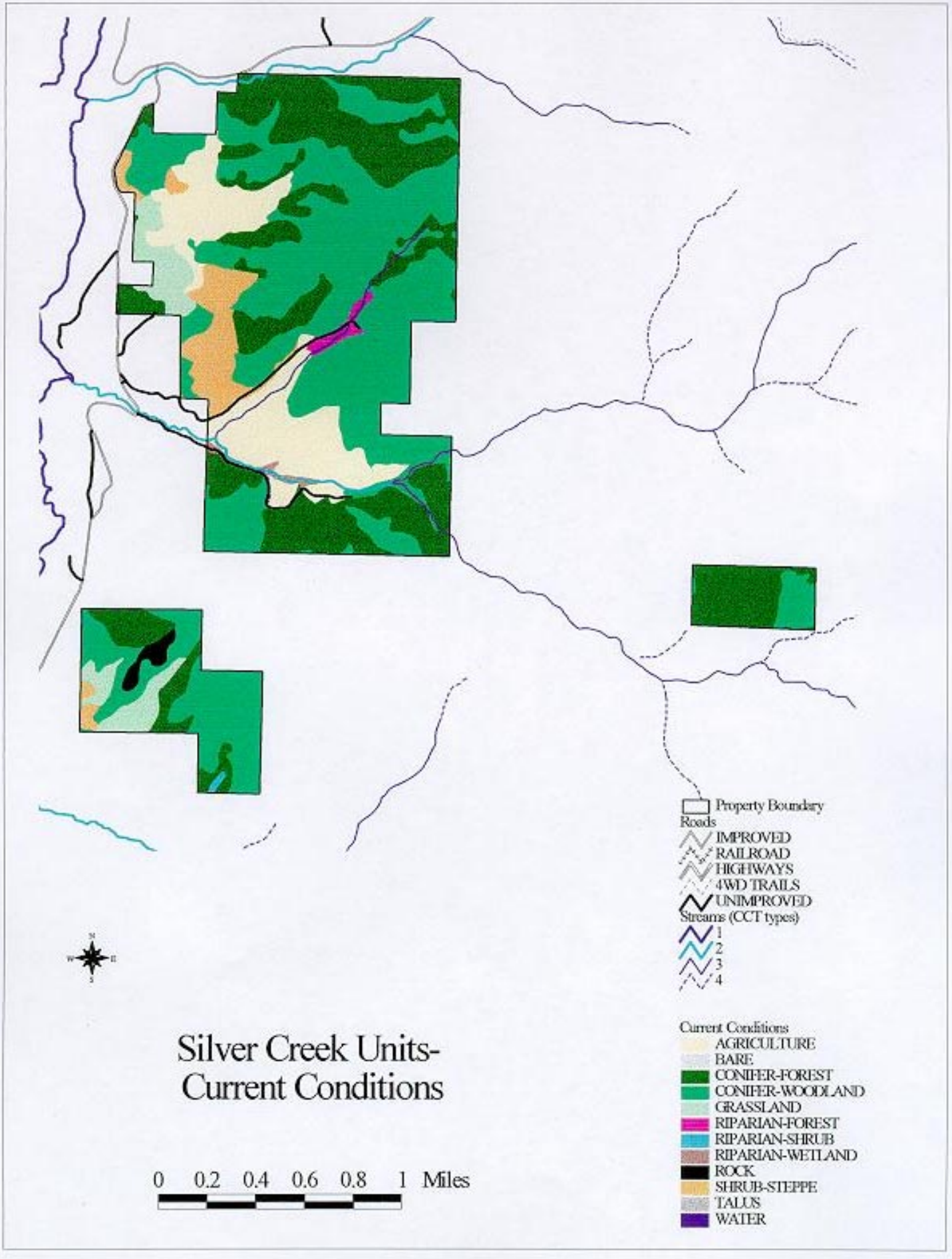
4

Contours (40ft.[E])

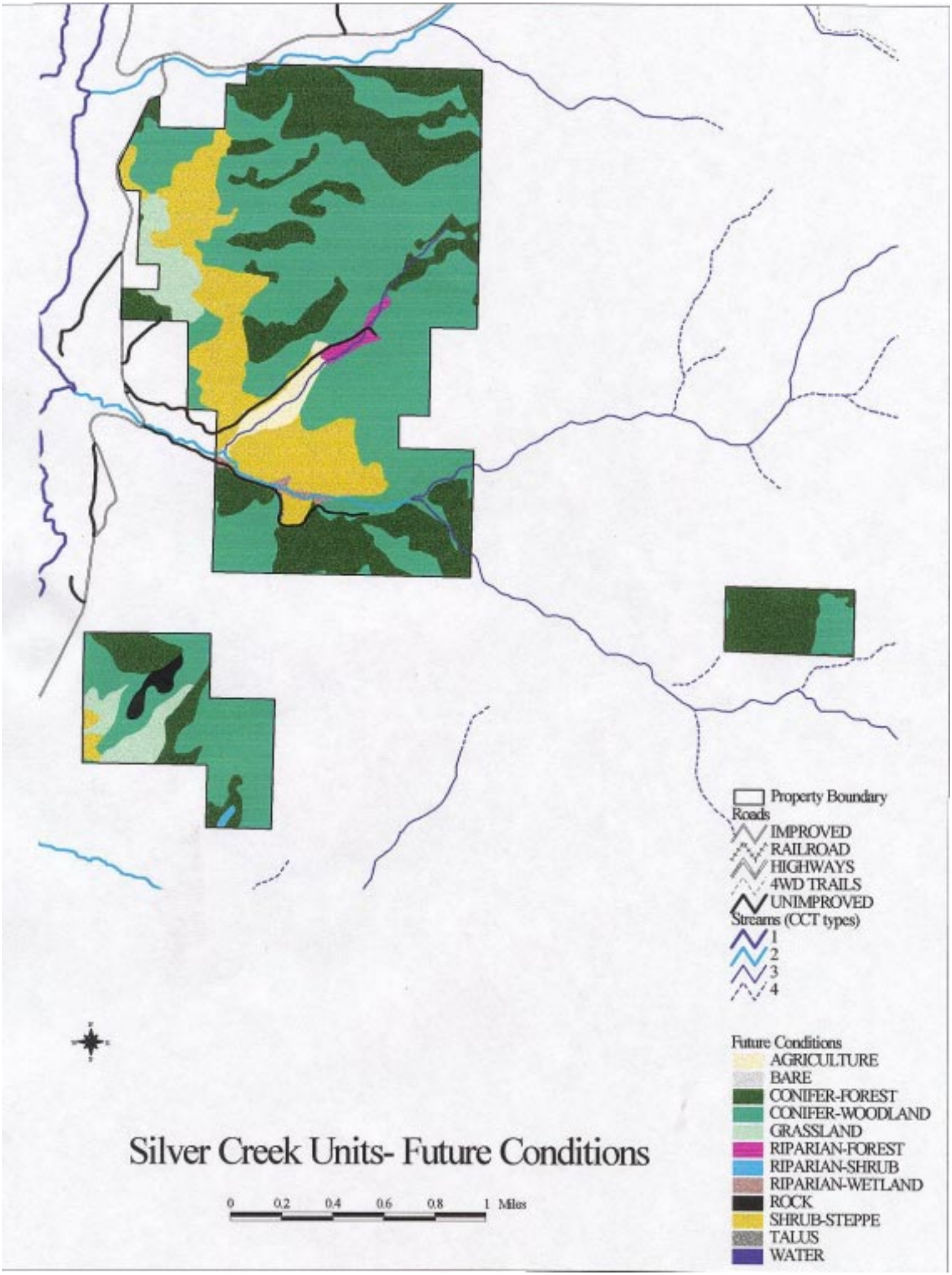
Silver Creek Units- Topography

0 0.2 0.4 0.6 0.8 1 Miles


Legend
Property Boundary
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Streams (CCT types)
Streams (CCT types)
Soils
AQUIC XEROFLUVENTS
BEARSPRING LOAM
BERNHILL LOAM
BONG SANDY LOAM
CEDONIA SILT LOAM
DINKELMAN LOAM
EWALL
FIVELAKES
GEORGECREEK SILT LOAM
HALEY
HAPLOXEROLLS
HELLGATE GRAVELLY COARSE SANDY LOAM
JOHNTOM, ROCK OUTCROP
LOUISCREEK GRAVELLY LOAM
NARCISSE SILT LOAM
NORTHSTAR GRAVELLY LOAM
OWHI
PHOEBE FINE SANDY LOAM
PICARD
RALSEN SILT LOAM
ROCK OUTCROP
SCALA VERY FINE SANDY LOAM
SCOAP GRAVELLY LOAM
SKANID GRAVELLY SANDY LOAM
SPENS VERY STONY LOAMY SAND
SPOKANE LOAM
SPOKANE, SKANID COMPLEX
SWAKANE COBBLY LOAM
SWAKANE-ROCK OUTCROP
THOUT GRAVELLY LOAM
THOUT,DRY-ROCK OUTCROP COMPLEX
TYEE
ULTIC HAPLOXEROLLS
VANBRUNT-ROCK OUTCROP
WHITESTONE LOAM
Silver Creek Units- Soils
0 0.2 0.4 0.6 0.8 1 Miles



Silver Creek Units- Current Conditions



Silver Creek Units- Future Conditions

Kuehne Ranch Management Unit.
This unit is located east of the Sanpoil River near Lake Roosevelt and contains both former William and Henry Kuehne ranch parcels. William Kuehne estate still holds title to 290 ac. and Henry and Gail Kuehne hold title to approximately 420 ac. within this large unit (Figure 21). This unit is bounded on the west by Sanpoil River and Henry Kuehne property and on the south by Lake Roosevelt and William Kuehne property. This management unit totals 9,614 acres and is bounded on the north and east by Tribal lands. The area was used mostly for rangeland and winter feedlots. About one third of the area is composed of rocky foothills with little or no tree cover. A few ephemeral springs run through the large draws draining into the Sanpoil River and provide about 39 acres of riverine habitat. The rest of the area is composed of a series of lakeshore benches covered with grasses with a few shrubs occurring on the sides of the draws. Some sites with suitable soils were farmed, both irrigated and non-irrigated, for the production of grain and hay crops. The irrigated areas have not been cropped in the last ten years and the non-irrigated areas were either enrolled into CRP or pastured. The remainder was pastured for the production of cattle. Most of the naturally occurring vegetation (grasses, forbs and shrubs) has been changed over the years to include cheat grass, mustards, solid stands of rabbitbrush and noxious weeds. The naturally occurring bitterbrush, sagebrush, currant, and serviceberry exist as remnants or have died out over time due to season long grazing and drought conditions.

Soils
Soils of this unit are mostly sand and gravely loam with rock outcrop complexes (Figure 22).
Management Goals for this unit
This unit is primarily shrub-steppe and grasslands that will be managed for mule deer winter range and sharp-tailed grouse summer range. The conifer woodland cover type will be expanded and maintained for species using that cover type. The riparian and mixed forest habitats will be enhanced and maintained. Restoration activities will be conducted over time to enhance and maintain optimum habitats for management species.

Short-term Management Goals:
- Convert the old CRP lands to grassland/shrub-steppe with suitable grasses, forbs, shrubs and a few trees.
- Restore the woody vegetation along the draws.
- Develop the ephemeral springs for wildlife if possible.
- Maintain noxious weed control over the entire area.
- Maintain the fence boundaries, roads, signs, and some of the existing structures.
- Maintain and/or plant cultural vegetation where possible.
- Prevent livestock trespass on Project lands.
- On areas that formerly supported shrub-steppe vegetation, restore the shrub component.

Long-term Management Goals:
- Restore the grassland areas to perennial species of grasses and forbs.
- Maintain road access as necessary for Project operations.
- Maintain the PIPO/PUTR habitat type on suitable sites and reestablish where missing.
- Control noxious weeds and undesirable annuals.
- Return the agricultural areas back to species found within the AGSP/POSA habitat type.

- Shrub-steppe habitats will be enhanced and maintained for HEP management species.
- Grasslands will be maintained in desired vegetation with little or no noxious weeds.
- Riparian areas will be protected, enhanced and maintained for those species using that cover type.
- The conifer woodland cover type will be maintained for mature growth of P. pine and associated vegetation.
- Management will use any and all tools to protect and maintain the habitat types on this unit.

Monitoring and Evaluation Activities:
- Wildlife population trends and habitat use.
- Vegetative community composition, succession stage and associated changes.
- Noxious weed control.
- Cultural and subsistence use of the area.
- Habitat component abundance and use (cavities, snags, dens and fawning areas, etc.,).

Cover Types on this unit:
GRASSLAND / AGRICULTURAL (177 acres):
There are several large areas that were used for the production of alfalfa hay on this unit. The natural grassland cover was converted and on some areas irrigated to produce high yields for the feeding of cattle. Management actions in the future will return these areas to desired grasses and forbs for wildlife. Presently these areas are monitored to control noxious weeds and unwanted species. Eventually the area will be planted to suitable grasses and forb species for diversity, food and cover.

CONIFER WOODLAND (93 acres):
The area supports scattered stands or lone Ponderosa pine trees creating this cover type. Past land use and cattle grazing has suppressed and/or eliminated the understory shrubs over most of the area. Management for this cover type is to maintain the open Ponderosa pine woodland cover type with associated understory vegetation composed of grasses, forbs and shrubs. The grasses, forbs and shrubs will be the preferred species to maximize food requirements of wildlife using this cover type.

FORESTED WETLAND (50 acres):
This cover type is composed mostly of Ponderosa pine with a stand of mixed deciduous trees where the water table is close to the surface. Management actions include enhancing and maintaining the deciduous tree stand with associated understory vegetation. Downy woodpecker was the species used to evaluate this cover type, which rated 0.8, meeting most of the life requirements of this species.

SHRUB-STEPPE (2,452 acres):
Grazing on this unit heavily impacted this cover type. Mule deer and sharp-tailed grouse were used to evaluate it. The shrub component over the entire area has increased while important grass and forb species have declined. The area in this cover type lacked the necessary food and cover requirements for these species. Management actions will include; maintaining the form and size classes of shrubs for wildlife cover and forage, treating decadent stands of desirable shrubs to increase vigor, planting palatable shrub species where applicable, opening solid stands

of shrubs to increase edge effect and/or do prescribe burns to portions to keep the total canopy closure of shrubs below 30%, and finally reduce the amount of rabbitbrush throughout the area and replace with sagebrush and/or bitterbrush.

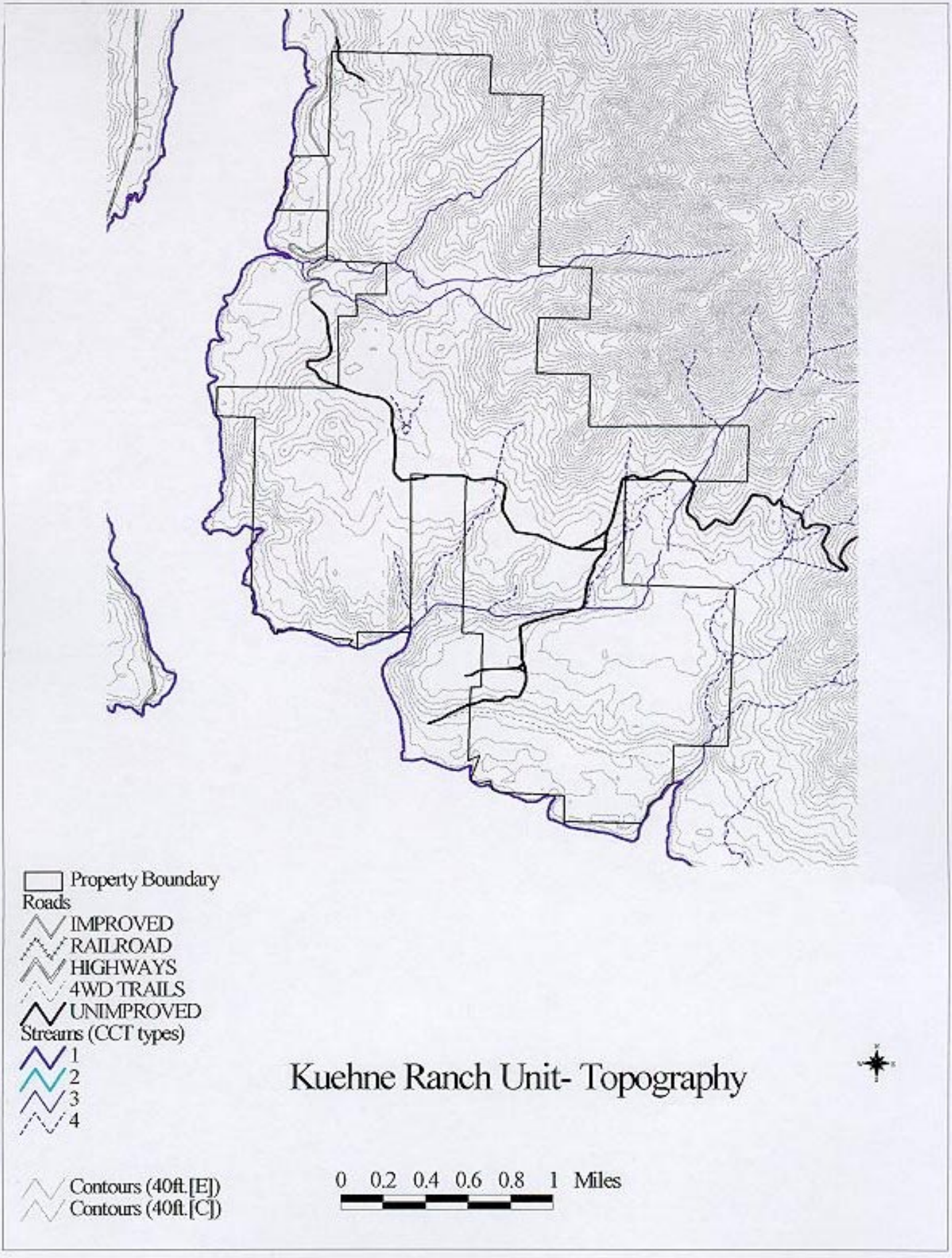
RIVERINE (39 acres):
This cover type is described as vegetation adjacent to aquatic systems. Riparian cover begins at the high water mark and extends to that portion of the landscape that is influenced by, or that directly influences, the aquatic ecosystem. This includes floodplains. This cover type occurs along the seasonally wet draws leading to Lake Roosevelt. It can be the most productive habitat for wildlife because most species depend on water. Most of this cover type has been altered by past land use and grazing impacts. Management will focus on eliminating the cause of the decline. Mink was used to evaluate this cover type which rated an HSI of 0.3. Habitat conditions are improving now that livestock have been removed from this unit. Restoration will take place with supplemental planting of riparian dependant species to increase diversity and quantity.

SHORELINE (4 acres):
This cover type is directly effected by hydropower operations, which change the water levels along the shoreline. High water releases flood shoreline areas inundating habitat and low water levels leave large exposed areas devoid of food and cover. Canada goose was used to evaluate this cover type which rated an HSI of 0.2, due to lack of nesting and brood rearing requirements for this species. Management for this cover type will be limited by hydropower operations and target flows. Areas above the high water mark will be planted for brood pastures with desired grasses and forbs. Goose tubs may be erected in suitable locations along the shoreline to increase nesting areas for this species.

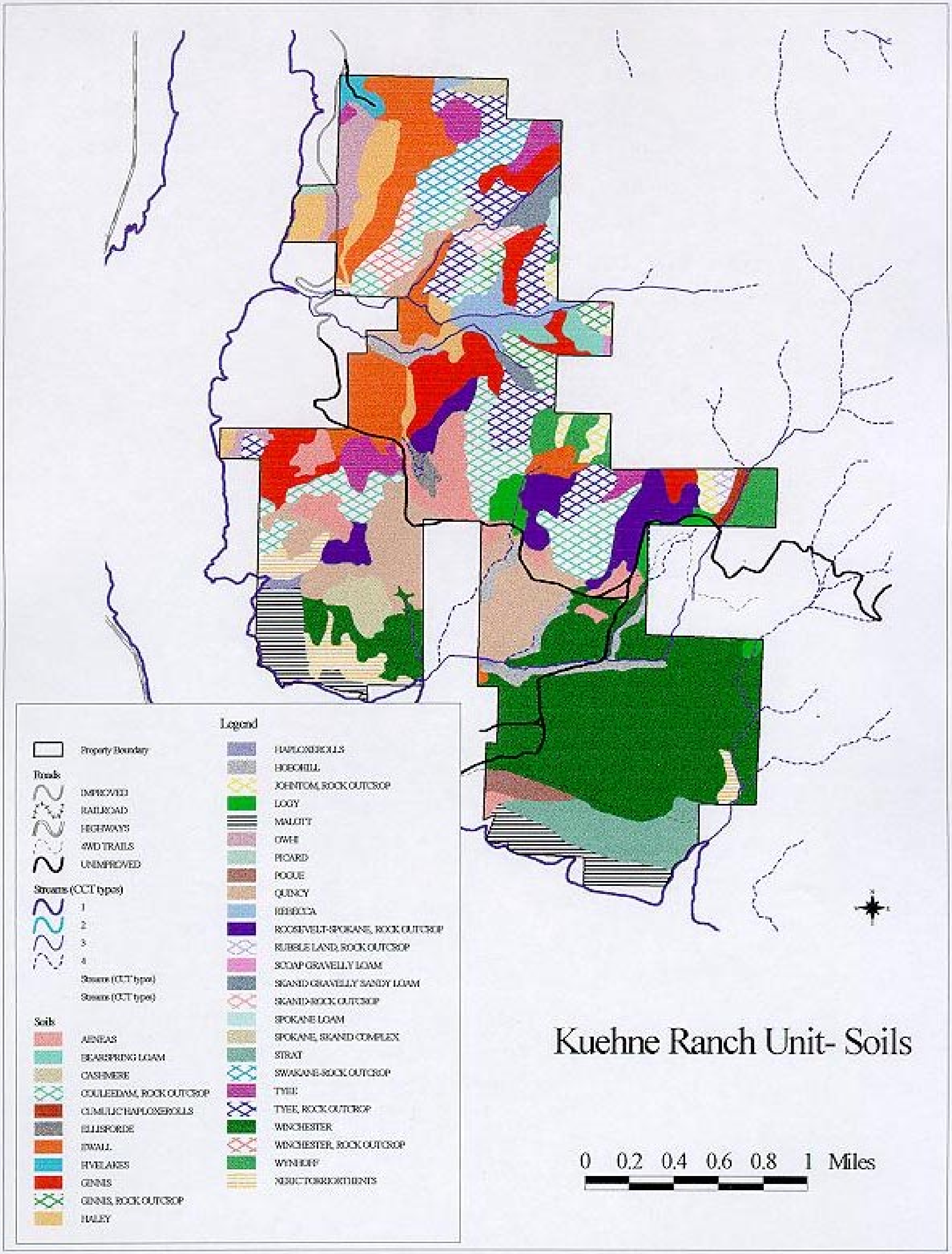
Table 12. Current and desired future cover types, HEP species and results for the Kuehne Ranch Unit.

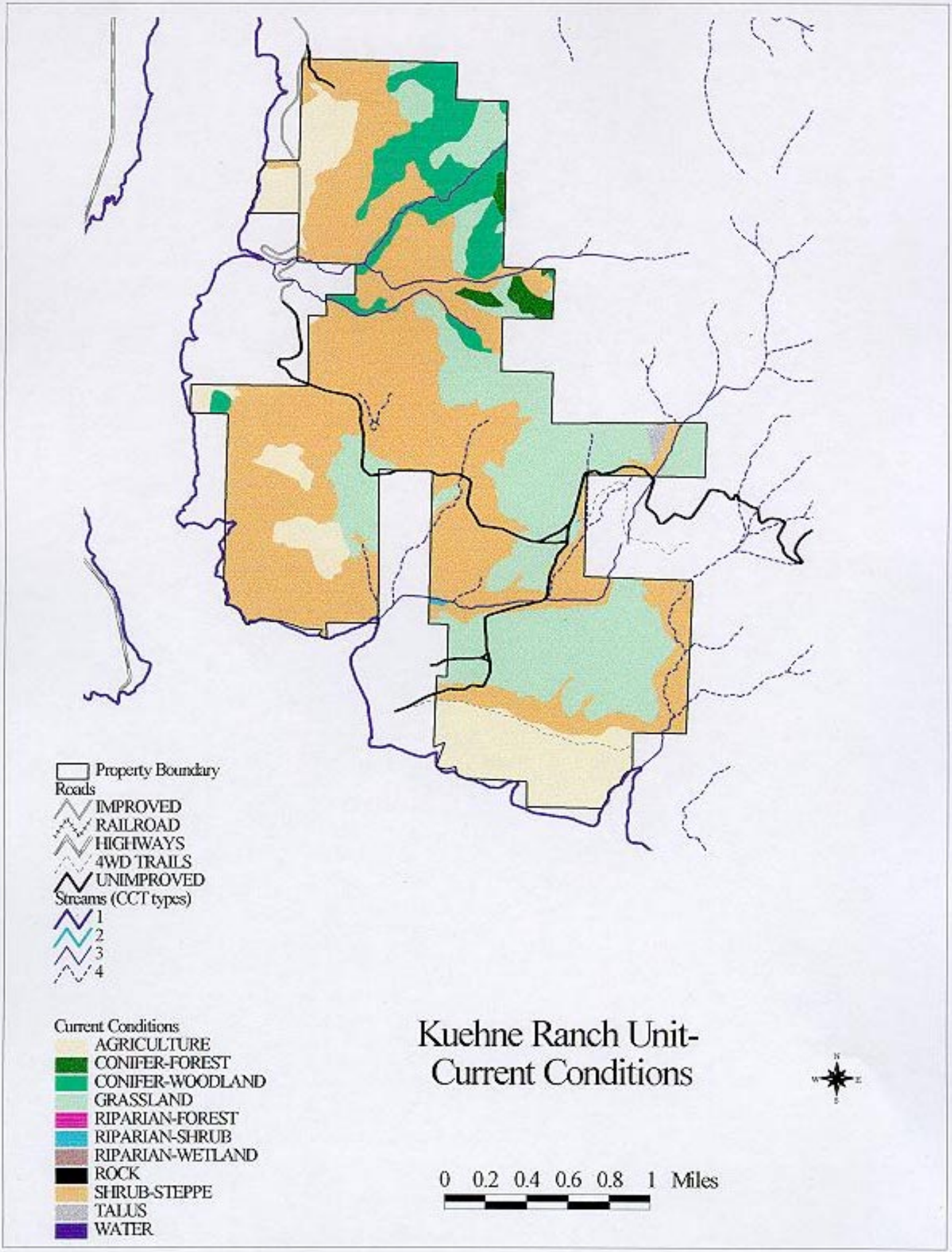
Cover Type	HEP Species	HSI	Acres	HU's
CURRENT CONDITIONS				
Agriculture	Sharp-tailed Grouse	0.05	177	9
Conifer Woodland	Mule Deer	0.5	93	46
Forested Wetland	Downy Woodpecker	0.8	50	40
Shoreline	Canada Goose	0.2	4	1
Shrub-steppe	Mule Deer	0.5	2,452	1,226
Shrub-steppe	Sharp-tailed Grouse	0.5	2,452	1,226
Riverine	ink	0.3	39	12
FUTURE CONDITIONS				
Shrub-steppe	Mule Deer	0.6	2,452	1,471
Shrub-steppe	Sharp-tailed Grouse	0.6	2,452	1,471
Grassland	Sharp-tailed Grouse	0.5	177	88
Conifer Woodland	Mule Deer	0.6	93	56
Forested Wetland	Downy Woodpecker	0.8	50	40
Shoreline	Canada Goose	0.3	4	1
Riverine	Mink	0.5	39	19

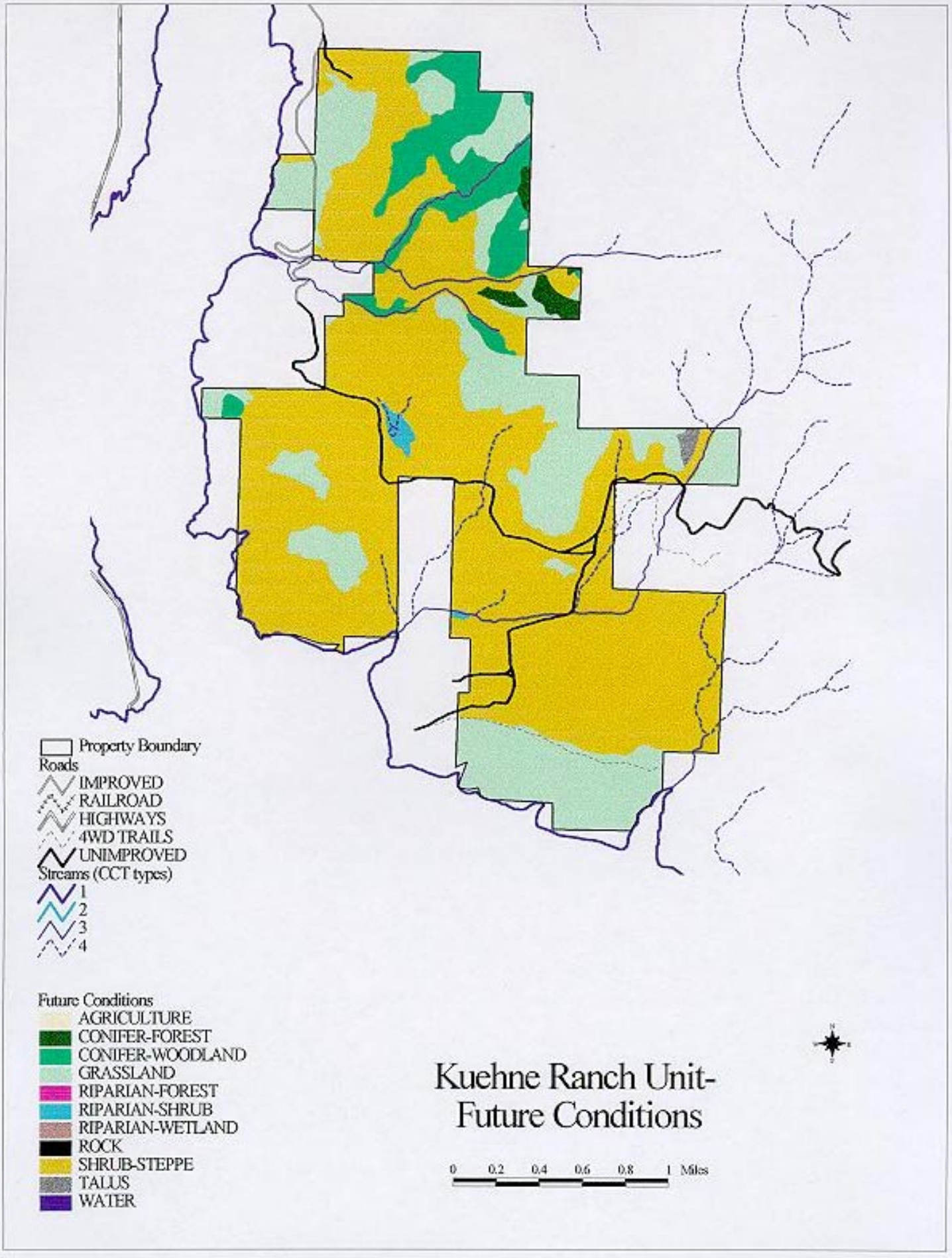
Current conditions are drawn in Figure 23 for this unit. Management actions to reach the desired future conditions include converting the agricultural land to grassland and shrub-steppe (Figure 24). Riparian habitat diversity will increase for riparian species over time and conifer woodland habitat will be maintained to benefit mule deer using the area as winter range. Maintaining a diversity of grasses and forbs under palatable sage and bitterbrush shrub species will enhance the shrub-steppe areas.



Kuehne Ranch Unit- Topography


Legend
Property Boundary
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Streams (CCT types)
Streams (CCT types)
Soils
AENEAS
BEARSPRING LOAM
CASHMERE
COULEEDAM, ROCK OUTCROP
CUMULIC HAPLOXEROLLS
ELLISFORDE
EWALL
FIVELAKES
GINNIS
GINNIS, ROCK OUTCROP
HALEY
HAPLOXEROLLS
HOBOHILL
JOHNTOM, ROCK OUTCROP
LOGY
MALOTT
OWHI
PICARD
POGUE
QUINCY
REBECCA
ROOSEVELT-SPOKANE, ROCK OUTCROP
RUBBLE LAND, ROCK OUTCROP
SCOAP GRAVELLY LOAM
SKANID GRAVELLY SANDY LOAM
SKANID-ROCK OUTCROP
SPOKANE LOAM
SPOKANE, SKANID COMPLEX
STRAT
SWAKANE-ROCK OUTCROP
TYEE
TYEE, ROCK OUTCROP
WINCHESTER
WINCHESTER, ROCK OUTCROP
WYNHOFF
XERIC TORRIORTHENTS
Kuehne Ranch Unit- Soils
0 0.2 0.4 0.6 0.8 1 Miles


Property Boundary
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Current Conditions
AGRICULTURE
CONIFER-FOREST
CONIFER-WOODLAND
GRASSLAND
RIPARIAN-FOREST
RIPARIAN-SHRUB
RIPARIAN-WETLAND
ROCK
SHRUB-STEPPE
TALUS
WATER
Kuehne Ranch Unit-
Current Conditions
N
W
E
S
0 0.2 0.4 0.6 0.8 1 Miles


Property Boundary
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Future Conditions
AGRICULTURE
CONIFER-FOREST
CONIFER-WOODLAND
GRASSLAND
RIPARIAN-FOREST
RIPARIAN-SHRUB
RIPARIAN-WETLAND
ROCK
SHRUB-STEPPE
TALUS
WATER
Kuehne Ranch Unit-
Future Conditions
0 0.2 0.4 0.6 0.8 1 Miles

Williams Flat Management Unit.

The majority of this unit lies on a large terrace above Lake Roosevelt (Figure 25). This unit is composed of the former William and Henry Kuehne properties (1,520 acres total). Cover types within this unit include coniferous forest, mixed forest, conifer woodland (Ponderosa pine), shrub-steppe, agriculture, grassland, riparian, and rock. Except for the agricultural portions, the unit was used for grazing. About half of the unit is fenced, the steep rocky area to the south is not fenced and the forested areas are not completely fenced (12 miles of perimeter fences). The large terrace was cleared for the production of wheat and barley then the acres were enrolled into the Conservation Reserve Program (CRP) in 1987. These fields were fenced to prevent livestock trespass (476 acres). In 1997, only those portions containing highly erodable soils were enrolled into new CRP (320 acres). The drainage bisecting the terrace once contained a sheep camp with log cabins, outbuildings and a large barn. Some of the camp's outbuildings have collapsed and some need repairs to be serviceable. A variety of wildlife use this area including, mule and white-tailed deer, elk, upland birds and small mammals.

Crop History of Williams Flat

1980	1981	1982	1983	1984	1985	1986	1987	1988	1997
SF	Wheat	SF	Wheat	SF	Alfalfa	Alfalfa	Alfalfa	CRP	CRP

SF = Summer Fallow.

Soils

The soils of this unit are mostly sandy loam and silts (Figure 26). Along the edge of the terraces some rock outcrops or talus occur. If left undisturbed, the area would revert to *Agropyron spicatum/Poa sandbergii* habitat types to the east and south and *Pinus ponderosa/Festuca idahoensis* habitat types over the rest of the area. Before the agricultural fields were created those areas were covered with an open pine forest. Douglas firs with snowberry and/or ninebark were present in the moist drainage radiating away from the terrace. Today these species can still be found on the unit in limited numbers. Most of the grasses and forbs have been selectively removed by livestock grazing and replaced by exotics. The percent of shrub species (bitterbrush and sagebrush) have increased where deeper soils exist.

Management Goals for this unit:

Short-term Management Goals:

- Construct new fences where needed and maintain boundary fences.
- Control noxious weeds.
- Maintain the CRP areas.
- Enhance and restore the riparian corridor along Brody Creek.
- Install cattle guards on the access road at the entrance and end of the property.
- Maintain the buildings used by the Project.
- Develop the springs on this unit for wildlife.
- Plant desired shrubs to supplement existing vegetation.

Long-term Management Goals:

- Restore the grassland areas to perennial species of grasses and forbs.

- Maintain road access as necessary for Project operations.
- Maintain the PIPO/PUTR habitat type on suitable sites and reestablish where missing.
- Control noxious weeds and undesirable annuals.
- Return the agricultural areas back to species found within the AGSP/POSA habitat type.
- Shrub-steppe habitats will be enhanced and maintained for HEP management species.
- Grasslands will be maintained in desired vegetation with little or no noxious weeds.
- Riparian areas will be protected, enhanced and maintained for those species using that cover type.
- The conifer forest cover type will be maintained for mature growth of P. pine and associated vegetation.
- Management will use any and all tools to protect and maintain the habitat types on this unit.

Monitoring and Evaluation Activities:
- Wildlife population trends and Habitat use.
- Vegetative community composition, succession stage and associated changes.
- Noxious weed control applications.
- Monitor cultural and subsistence use of the area.
- Habitat component abundance and use (cavities, snags, etc.,).

AGRICULTURAL AND GRASSLAND COVER (450 acres):
- Control noxious weeds and unwanted species.
- Plant suitable grasses and forb species for diversity, food and cover.
- Maintain vigor by burning, mowing or grazing.
- Increase the number of shrubs throughout the area for structure and cover.

CONIFER WOODLAND COVER (370 acres):
- Maintain the canopy cover of Ponderosa pine over desired grasses and forbs.
- Control noxious weeds as necessary.
- Manage for large trees with at least two large snags per acre.

CONIFER FOREST COVER (300 acres):
- Maintain a mature multistory Ponderosa pine stand.
- Maintain the overall tree canopy closure around 70% for the forested areas.
- Maintain at least 6 snags per acre, 2 greater than 20” dbh.

RIVERINE COVER (26 acres):
- Plant suitable shrub and tree species along the creek and around the springs.
- Enhance wetland vegetation along the creek and springs.
- Plant suitable cultural and subsistence vegetation.

SHRUB-STEPPE COVER (270 acres):
- Maintain form and size classes of shrubs for wildlife cover and forage.
- Treat decadent stands of desirable shrubs to increase vigor when feasible and plant palatable shrub species when necessary.

- Open solid stands of shrubs to increase edge effect and maintain.
- When necessary burn portions to keep the total canopy closure of shrubs below 30%.
- Reduce the amount of rabbitbrush throughout the area and replace with sagebrush.

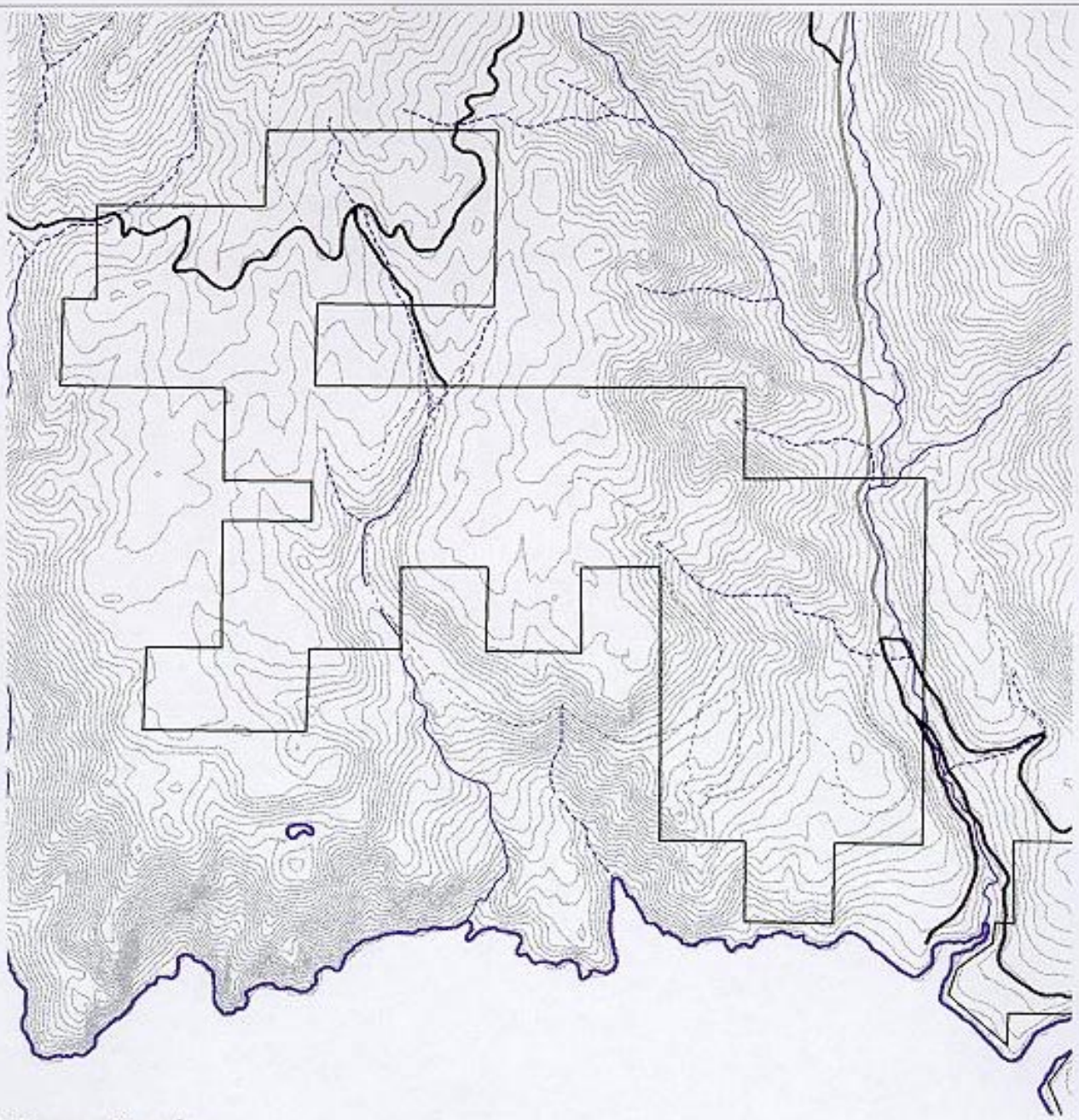
ROCK COVER (34 acres):
- Maintain and enhance the plant communities within this cover type.
- Control noxious weeds.

FORESTED WETLAND COVER (70 acres)
This cover type is composed of mostly of Ponderosa pine with a stand of mixed deciduous trees where the water table is close to the surface. Management actions include enhancing and maintaining the deciduous tree stand with associated understory vegetation.

Table 13. Current and desired future cover types, HEP species and results for the Williams Flat Unit.

Cover Type	HEP Species	HSI	Acres	HU's
CURRENT CONDITIONS				
Agriculture	Sharp-tailed Grouse	0.05	450	22
Agriculture	Mourning Dove	0.5	450	225
Conifer Forest	Downy Woodpecker	0.8	370	300
Forested Wetland	Downy Woodpecker	0.8	70	56
Conifer Woodland	Mule Deer	0.5	300	150
Shrub-steppe	Mule Deer	0.5	270	135
Shrub-steppe	Sharp-tailed Grouse	0.5	270	135
Rock	Bobcat	0.6	34	20
Riverine	Mink	0.3	26	8
FUTURE CONDITIONS				
Grassland	Sharp-tailed Grouse	0.5	450	225
Grassland	Mourning Dove	0.5	450	225
Conifer Woodland	Mule Deer	0.5	370	46
Forested Wetland	Downy Woodpecker	0.8	70	40
Rock	Bobcat	0.6	34	20
Shrub-steppe	Mule Deer	0.6	270	162
Shrub-steppe	Sharp-tailed Grouse	0.6	270	162
Conifer Forest	Downy Woodpecker	0.8	300	240
Riverine	Mink	0.5	26	13

Figure 27 shows the current conditions for this unit. Management actions to reach the desired future conditions (Figure 28) include converting the agricultural land to grassland. Riparian habitat diversity will increase for riparian species over time and conifer woodland habitat will be maintained to benefit mule deer using the area as winter range. Maintaining a diversity of grasses and forbs under palatable sage and bitterbrush shrub species will enhance the shrub-steppe areas. The conifer and mixed forest cover types will be maintained in their present state for the next ten years.



Property Boundary

Roads

IMPROVED

RAILROAD

HIGHWAYS

4WD TRAILS

UNIMPROVED

Streams (CCT types)

1

2

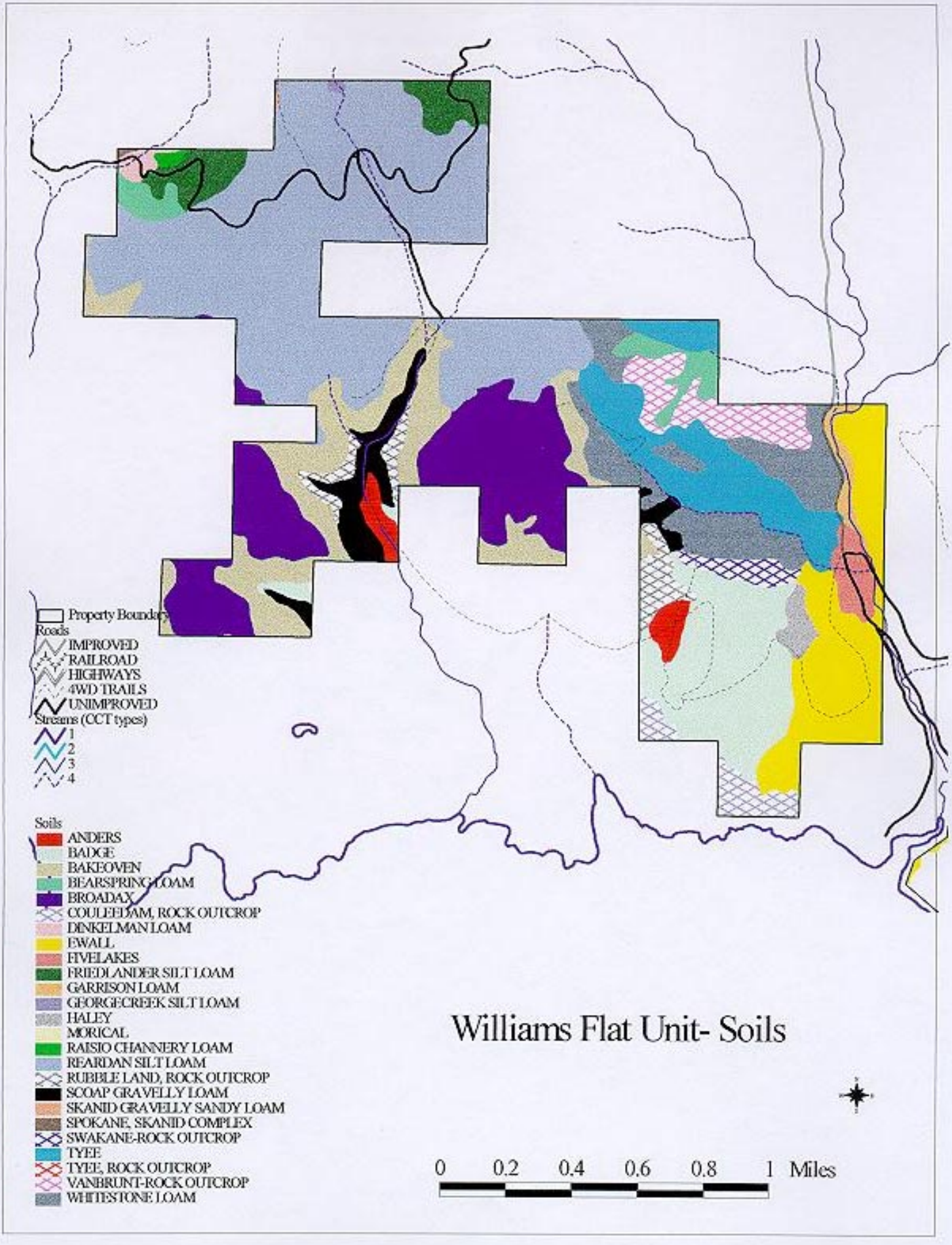
3

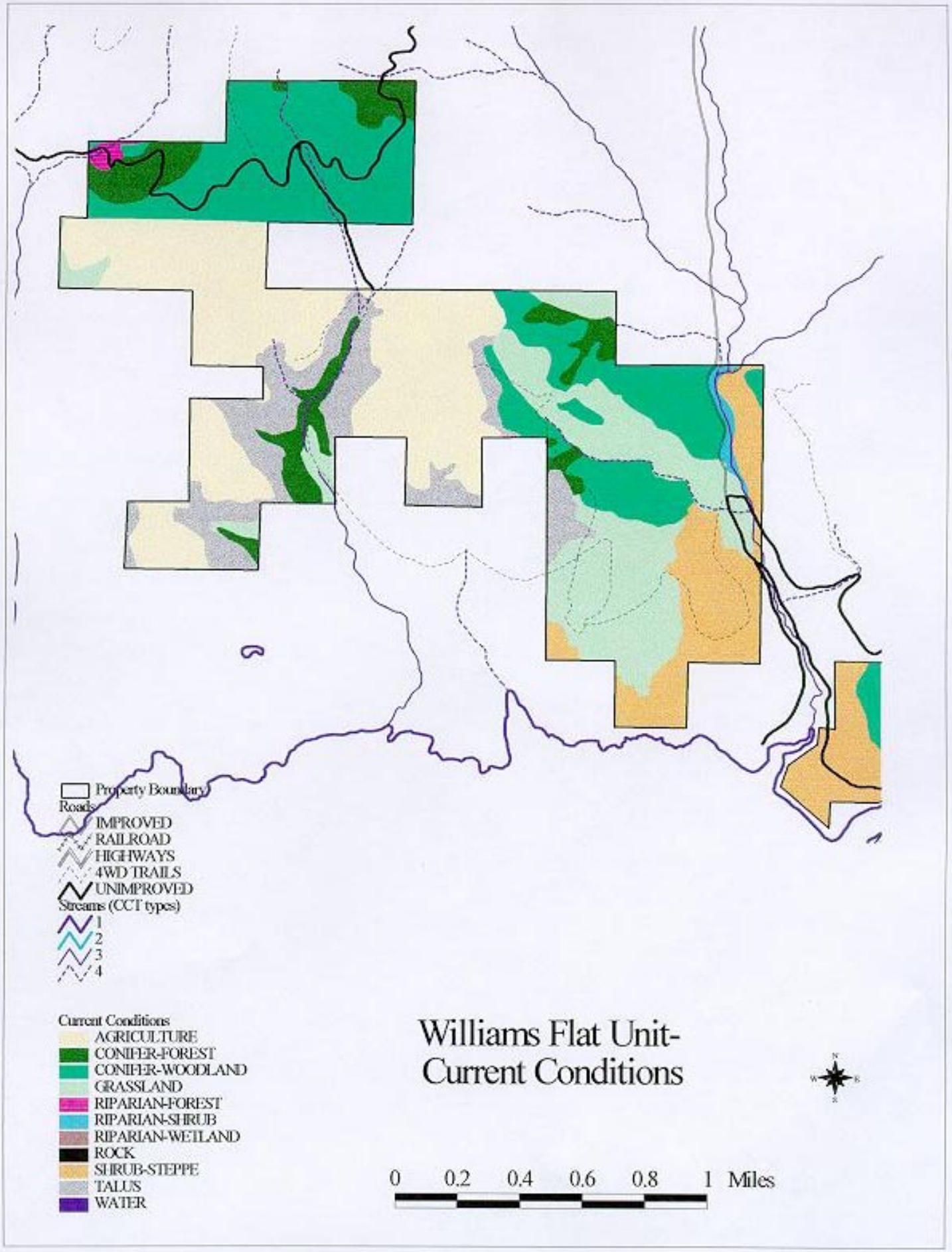
4

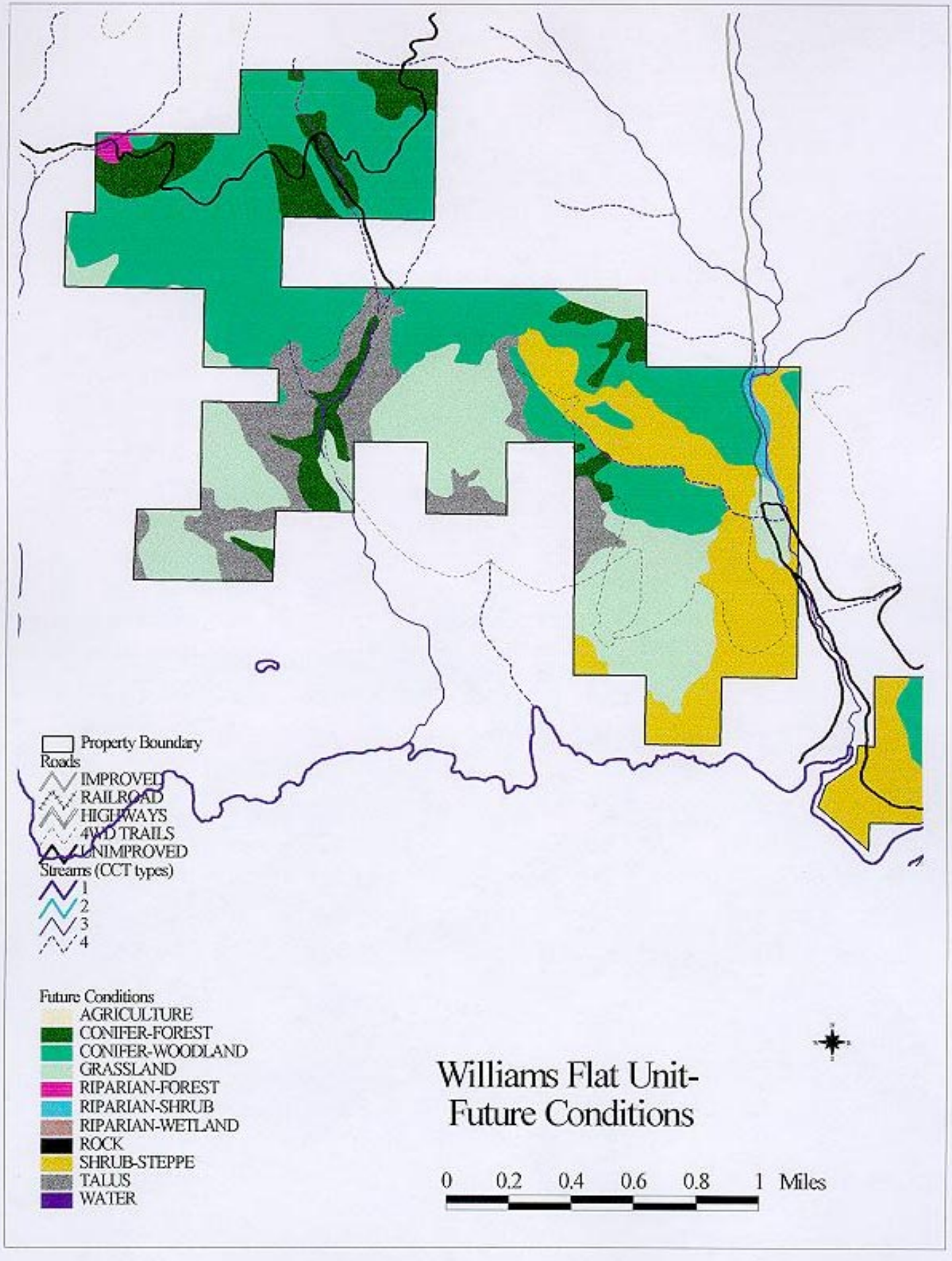
Contours (40ft.[E])

Williams Flat Unit- Topography

0 0.2 0.4 0.6 0.8 1 Miles


Property Boundary
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Soils
ANDERS
BADGE
BAKEOVEN
BEARSPRING LOAM
BROADAX
COULEE DAM, ROCK OUTCROP
DINKELMAN LOAM
EWALL
FIVE LAKES
FRIEDLANDER SILT LOAM
GARRISON LOAM
GEORGE CREEK SILT LOAM
HALEY
MORICAL
RAISIO CHANNERY LOAM
REARDAN SILT LOAM
RUBBLE LAND, ROCK OUTCROP
SCOAP GRAVELLY LOAM
SKANID GRAVELLY SANDY LOAM
SPOKANE, SKANID COMPLEX
SWAKANE-ROCK OUTCROP
TYEE
TYEE, ROCK OUTCROP
VANBRUNT-ROCK OUTCROP
WHITESTONE LOAM
Williams Flat Unit- Soils
0 0.2 0.4 0.6 0.8 1 Miles


Property Boundary
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Current Conditions
AGRICULTURE
CONIFER-FOREST
CONIFER-WOODLAND
GRASSLAND
RIPARIAN-FOREST
RIPARIAN-SHRUB
RIPARIAN-WETLAND
ROCK
SHRUB-STEPPE
TALUS
WATER
Williams Flat Unit-
Current Conditions
N
W
E
S
0 0.2 0.4 0.6 0.8 1 Miles


Property Boundary
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Future Conditions
AGRICULTURE
CONIFER-FOREST
CONIFER-WOODLAND
GRASSLAND
RIPARIAN-FOREST
RIPARIAN-SHRUB
RIPARIAN-WETLAND
ROCK
SHRUB-STEPPE
TALUS
WATER
Williams Flat Unit-
Future Conditions
0 0.2 0.4 0.6 0.8 1 Miles

Sand Hills Management Unit (Kuehne)

This unit is part of the former Henry and Bill Kuehne holdings (369 and 460 acres) plus the land north and west of Redford canyon (221 acres) for a total of 1,050 acres. The Unit is bordered on the west by Lake Roosevelt and except for a small parcel on the north is surrounded by Tribal lands (Figure 29). The area is predominantly shrub-steppe dominated by bitterbrush with an overstory of Ponderosa pines. Some pockets of riparian vegetation occur adjacent to the watercourses. The area has never been fenced and lies within Range Unit 21 of the Tribal Grazing System. Unregulated livestock use, in terms of stocking densities and seasonal concentration have led to overgrazing and vegetative changes to this unit. There are no buildings on the property and the area has been logged and burned in the past. The logging and fire created open space destroying some bitterbrush and Ponderosa pine stands. As the name Sand Hills implies soils of this unit are composed of fine sands. Wind and water erosion occurs on steeper areas were livestock and fire removed ground cover. Lightning caused fires have occurred in the past and eliminated most of the bitterbrush and some pines on the northeast side of the parcel. Noxious weeds, cactus and cheatgrass have spread across the area and spots containing bare ground exist where livestock have concentrated. This unit and the land to the south provide critical winter range for deer and elk.

Soils

The soils of this unit are mainly fine sand (Figure 30).

Management Goals for this unit:

This unit will be managed as summer and winter range for mule deer. The tree canopy coverage will be maintained at less than 30 % of the entire area to allow preferred understory shrubs, mainly bitterbrush, to dominate the area.

Short-term Management Goals:

- Construct boundary fences to exclude livestock trespass.
- Restore degraded riparian habitats along the draws.
- Develop grassland and shrub habitats for wildlife food and cover.
- Maintain noxious weed control over the entire area.
- Maintain and/or plant cultural vegetation where possible.

Long Term Management Goals:

- Maintain the PIPO/PUTR/AGSP habitat found on this site.
- Maintain grassland areas in desired vegetation with little or no noxious weeds.
- Protect, enhance and maintain the riverine cover for those wildlife species using that cover type.
- Maintain the access road as necessary for project operations.
- Maintain the conifer woodland for mature growth of Ponderosa pine and associated understory vegetation.
- Increase the amount and diversity of herbaceous vegetation over the entire area.

Monitoring and Evaluation Activities:

- Monitor wildlife population trends and habitat use of the different areas.

- Record and evaluate vegetative community composition, succession stage and associated changes.
- Monitor measures for noxious weed control and evaluate the results.
- Document any cultural and subsistence use by Membership on this Unit.
- Record habitat component abundance and use (cavities, snags, dens and fawning areas, etc.,).

CONIFER WOODLAND COVER (431 acres):
- Maintain a mature multistory Ponderosa pine overstory.
- Maintain the overall canopy closure of shrubs at less than or equal to 30% over the entire area.
- Maintain at least 2 snags per acre, 2 greater than 20" dbh in forested stands.
- Maintain the grass/forb ratios associated with this cover type.

SHRUB-STEPPE COVER (573 acres):
- Maintain bitterbrush and sage stands to create edge habitats in or near the grassland habitats.
- Plant stands of deciduous shrubs where applicable throughout the drainage in the Unit.
- Maintain the shrub community in the size class and productive condition for deer and elk.

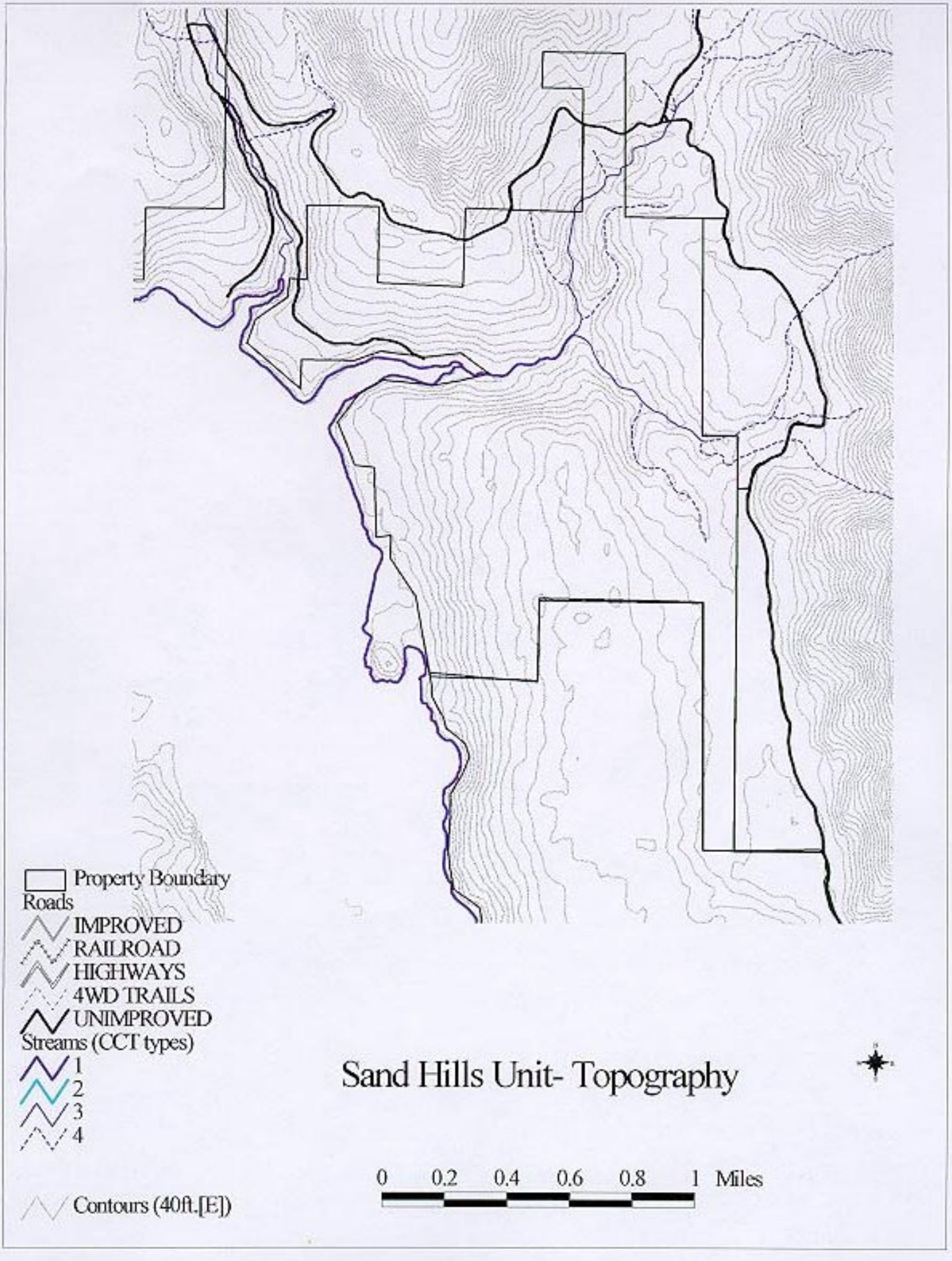
RIVERINE COVER (28 acres):
This cover type occurs along the Redford Canyon drainage. The lack of year round surface water prevents riparian obligate vegetation such as cattails, rushes and sedges from growing along the watercourse. In some areas, remnant stands of aspen occur. Season long grazing has decreased the amount and kind of vegetation within this area. Fencing to eliminate livestock grazing in the riparian areas will greatly improve this cover type. This area has the potential for a perennial stream corridor with year round surface water and associated vegetation.

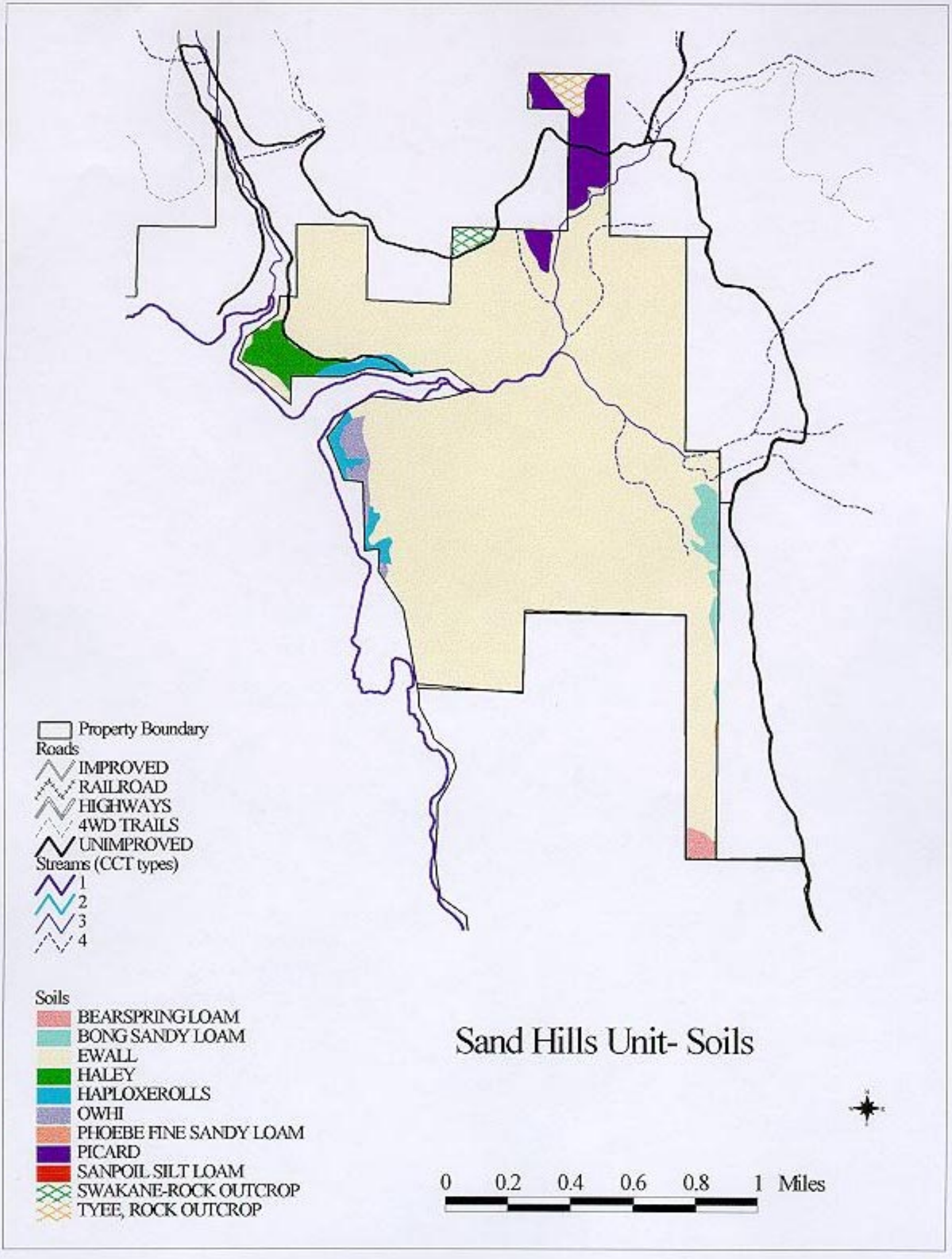
SHORELINE COVER (18 acres):
Establishment of permanent shoreline vegetation depends on the regulation of water levels and hydropower operations. When natural regeneration does occur it is either inundated or dehydrated depending on the water level of the Reservoir. Management for this area will include assisting established vegetation (deep rooted) and controlling noxious weeds. Opportunities for increasing Canada geese nesting with artificial nests occur only along the shore in areas where a brood pasture can be maintained.

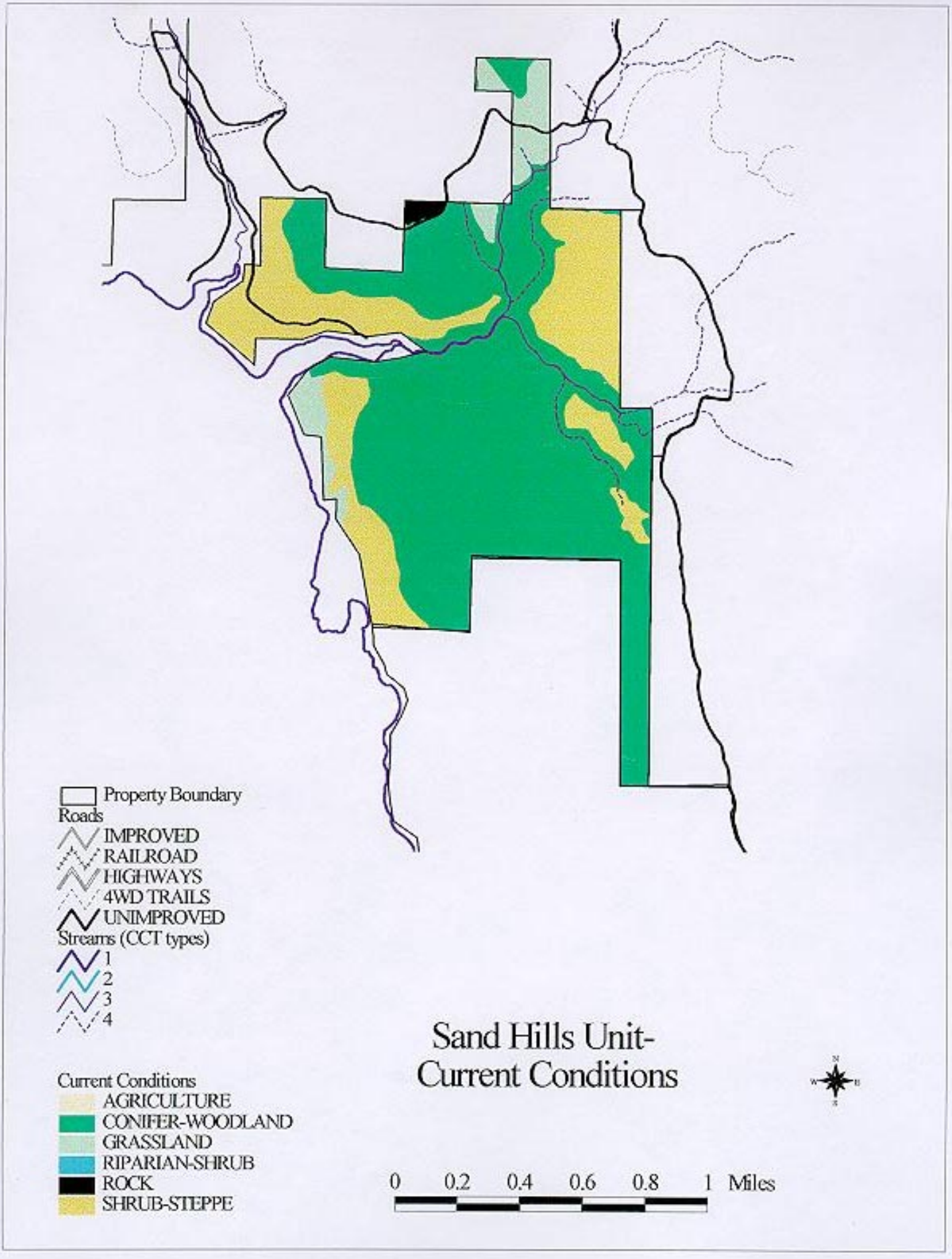
Table 14. Current and desired future cover types, HEP species and results for the Sandhills (Kuehne) Unit.

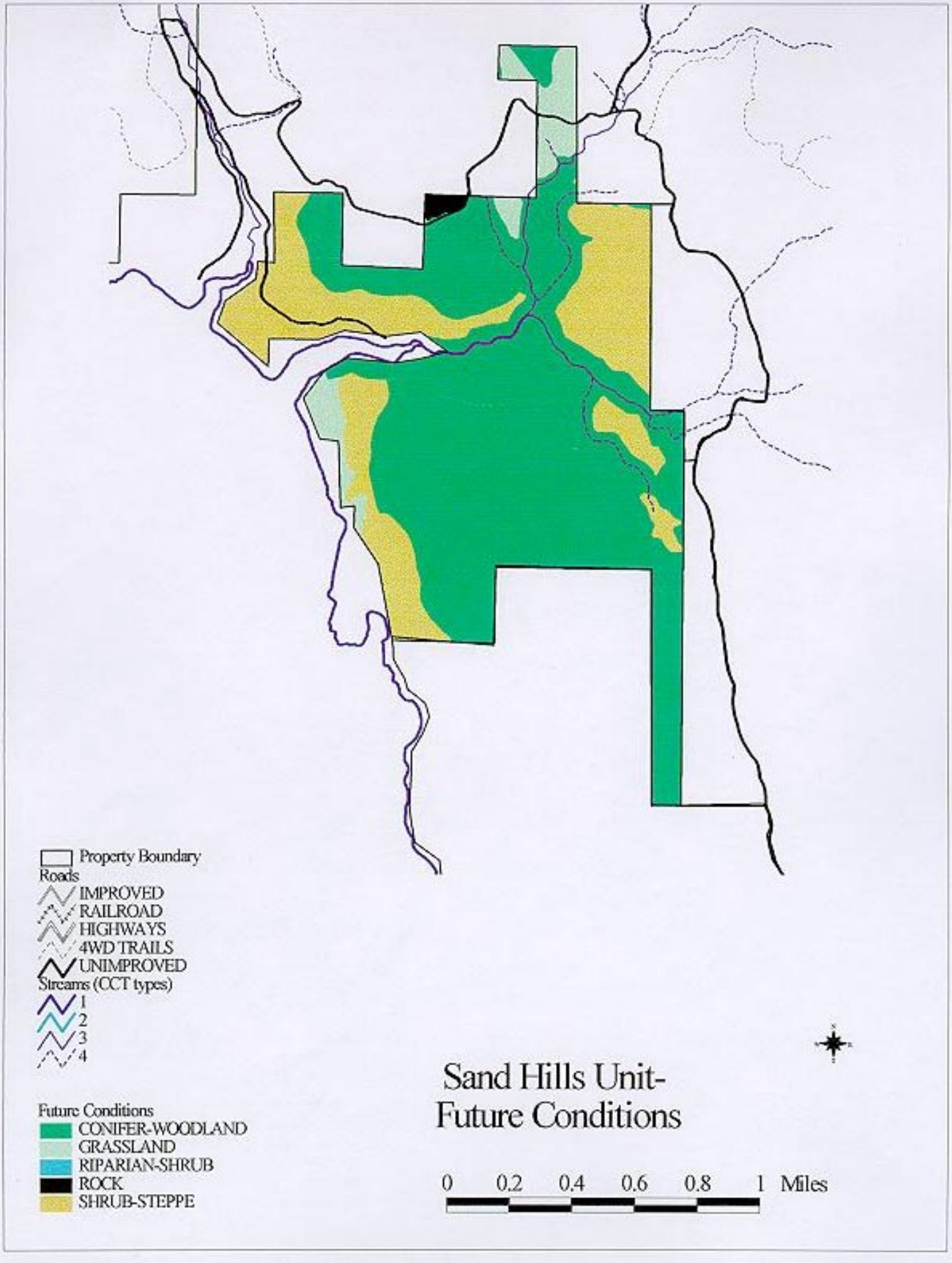
Cover Type	HEP Species	HSI	Acres	HU's
CURRENT CONDITIONS				
Shoreline	C. Goose	0.2	18	4
Conifer Woodland	Lewis' Woodpecker	0.5	431	215
Shrub-steppe	Mule Deer	0.6	573	344
Riverine	Mink	0.5	28	14
FUTURE CONDITIONS				
Shoreline	C. Goose	0.2	18	4
Conifer Woodland	Lewis' Woodpecker	0.5	431	215
Shrub-steppe	Mule Deer	0.7	573	401
Riverine	Mink	0.5	28	14

Figure 31 shows the current conditions for this unit. Future conditions (Figure 32) for this unit includes: increasing snag habitat for Lewis' woodpeckers in the conifer woodland cover. Maintaining a diversity of grasses and forbs under palatable sage and bitterbrush shrubs in the shrub-steppe cover for mule deer. Increasing the amount and kind of riparian and riparian-like shrub species along the intermittent watercourse of the Redford Canyon drainage. Maintaining rearing and brooding areas for Canada geese along the shoreline areas.


Property Boundary
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Contours (40ft.[E])
Sand Hills Unit- Topography
0 0.2 0.4 0.6 0.8 1 Miles


Property Boundary
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Soils
BEARSPRING LOAM
BONG SANDY LOAM
EWALL
HALEY
HAPLOXEROLLS
OWHI
PHOEBE FINE SANDY LOAM
PICARD
SANPOIL SILT LOAM
SWAKANE-ROCK OUTCROP
TYEE, ROCK OUTCROP
Sand Hills Unit- Soils
0 0.2 0.4 0.6 0.8 1 Miles


Property Boundary
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Sand Hills Unit-
Current Conditions
Current Conditions
AGRICULTURE
CONIFER-WOODLAND
GRASSLAND
RIPARIAN-SHRUB
ROCK
SHRUB-STEPPE
0 0.2 0.4 0.6 0.8 1 Miles


Property Boundary
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Future Conditions
CONIFER-WOODLAND
GRASSLAND
RIPARIAN-SHRUB
ROCK
SHRUB-STEPPE
Sand Hills Unit-
Future Conditions
0 0.2 0.4 0.6 0.8 1 Miles

Lundstrom Flat Management Unit

This unit contains 869 acres and is bordered on the south and west by Lake Roosevelt and Tribal lands on the north and east (Figure 33). The majority of the land is relatively flat and when settled was predominantly used to grow wheat and barley. From the 1960's to when the land was purchased for mitigation, it was used for pastureland. A portion of the area is rocky ground with patches of deciduous forest mixed with scattered Ponderosa pine and bitterbrush understory. There are 10 acres of riparian habitat located in the intermittent stream channel that empties into Lake Roosevelt. The former landowner's used this area for cattle production and did not maintain the fencing around the agricultural areas. An abandoned homestead lies on the eastside of the unit, near the edge of the old agricultural fields. The farmland portion is currently in cheatgrass, three-awn, crested wheatgrass, some alfalfa, cactus, bare ground, Ponderosa pine seedlings, and rabbitbrush. Houseboat renters frequently tie up to the shore areas to fish and explore this unit.

Soils

The soils of this unit are mainly sandy loam with areas of rock outcrop complexes (Figure 34). The flat benches contain relatively good soils and supported dryland wheat and other grain crops.

Management Goals for this unit:

To convert the agricultural land to native grassland for sharp-tailed grouse and species using this cover type.

To improve and maintain the riparian areas leading to Lake Roosevelt.

To maintain mature stands of large trees in the forested areas for wildlife species using these cover types.

To enhance and maintain the shrub-steppe cover for mule deer and other species using this cover type.

Short-term Management Goals:

- Enhance the grassland areas for sharp-tailed grouse and mule deer.
- Restore degraded riparian-like habitats along the draw.
- Develop a riparian corridor along the intermittent creek for wildlife if possible.
- Maintain noxious weed control over the entire area.
- Maintain the fence boundaries, roads, and add informational signs.
- Maintain and/or plant cultural vegetation where possible.

Long-term Management Goals:

- Have sharp-tailed populations use this area for reproduction, food and cover.
- Increase the deer use on the area for fawning, food and cover.
- Enhance and maintain suitable cover and forage to sustain deer and elk in winter.

Monitoring and Evaluation Activities:

- Wildlife population trends and Habitat use.
- Vegetative community composition, succession stage and associated changes.
- Weed control measures.

- Cultural and subsistence use of the area.
- Habitat component abundance and use (cavities, snags, dens and fawning areas, etc.,).
- Monitor recreational use of this area.

GRASSLAND / AGRICULTURAL COVER (433 acres):
- Prepare the soils for desired grasses, forbs and shrubs.
- Plant suitable grasses and forb species for diversity, food and cover.
- Control noxious weeds and unwanted species.
- Prescribe mosaic burns every 5 – 10 years to improve grassland vigor.

CONIFER WOODLAND COVER (150 acres):
- Maintain a scattered multistory Ponderosa pine overstory.
- Maintain an overall canopy closure of less than 70%.
- Maintain at least 2 snags per acre, 2 greater than 20" dbh along the eastern border.

SHRUB-STEPPE COVER (177 acres)
This cover type is mainly on the downslope of the terraces above the river. Management actions for include maintaining and expanding bitterbrush and sage stands, creating edge habitats in or near the grasslands. Also planting deciduous shrubs where applicable throughout the area while maintaining the shrub community for size class and palatability for deer and elk.

FORESTED WETLAND COVER (80 acres)
This cover type is composed of mostly of P. pine with a stand of aspen where the water table is close to the surface. Management actions include enhancing and maintaining the aspen stand with associated understory vegetation.

RIVERINE COVER (10 acres)
This cover type lacks suitable vegetation and the water source does not flow year round. Management actions include planting the area with suitable trees and/or shrubs to increase the water regime throughout the year.

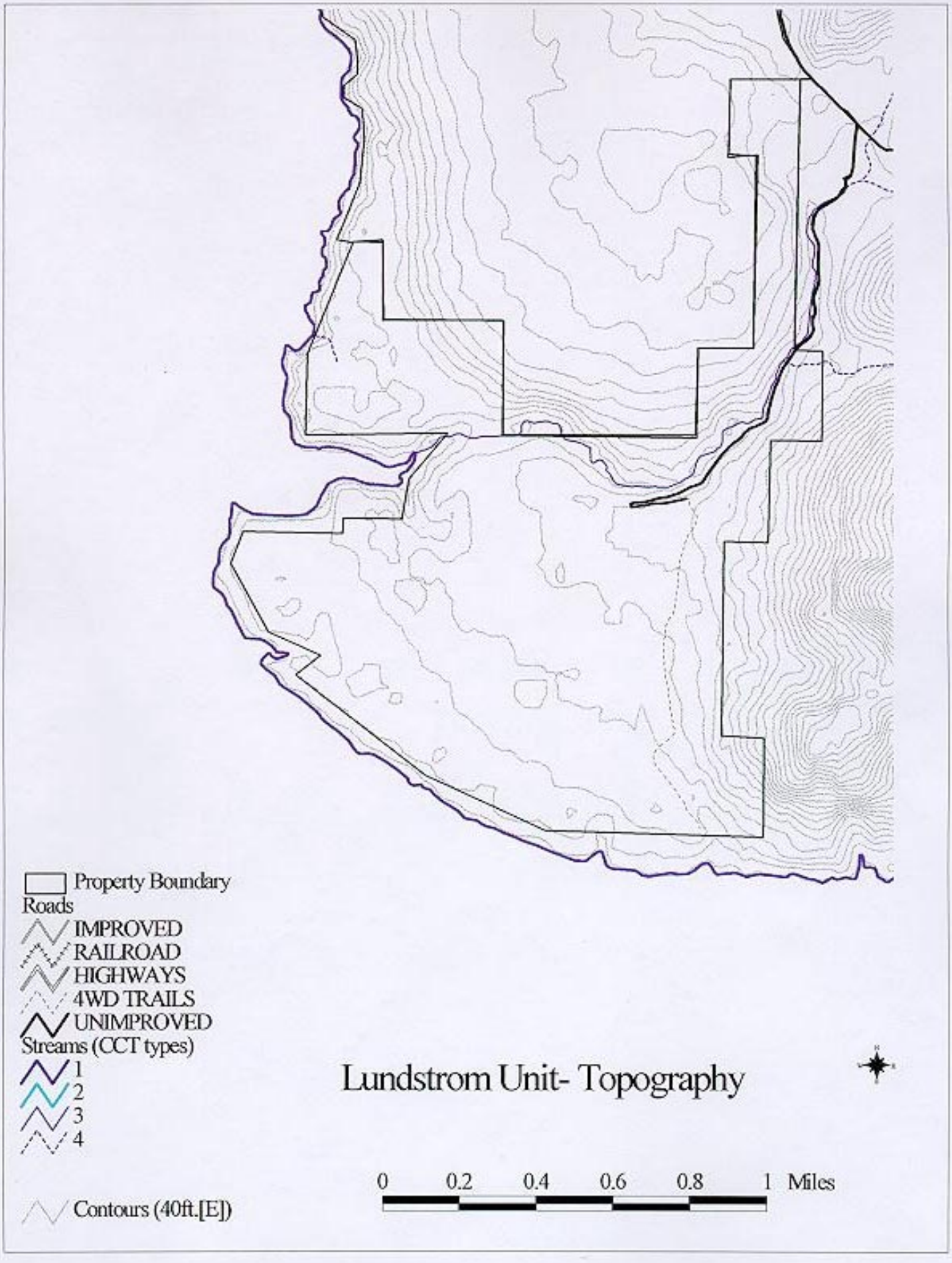
SHORELINE COVER (18 acres)
This area is composed of xeric torriorthents escarpments with little or no vegetation cover at present. Management actions include planting wheat or grass for brood pastures and installing goose nest tubs along the shoreline for this species.

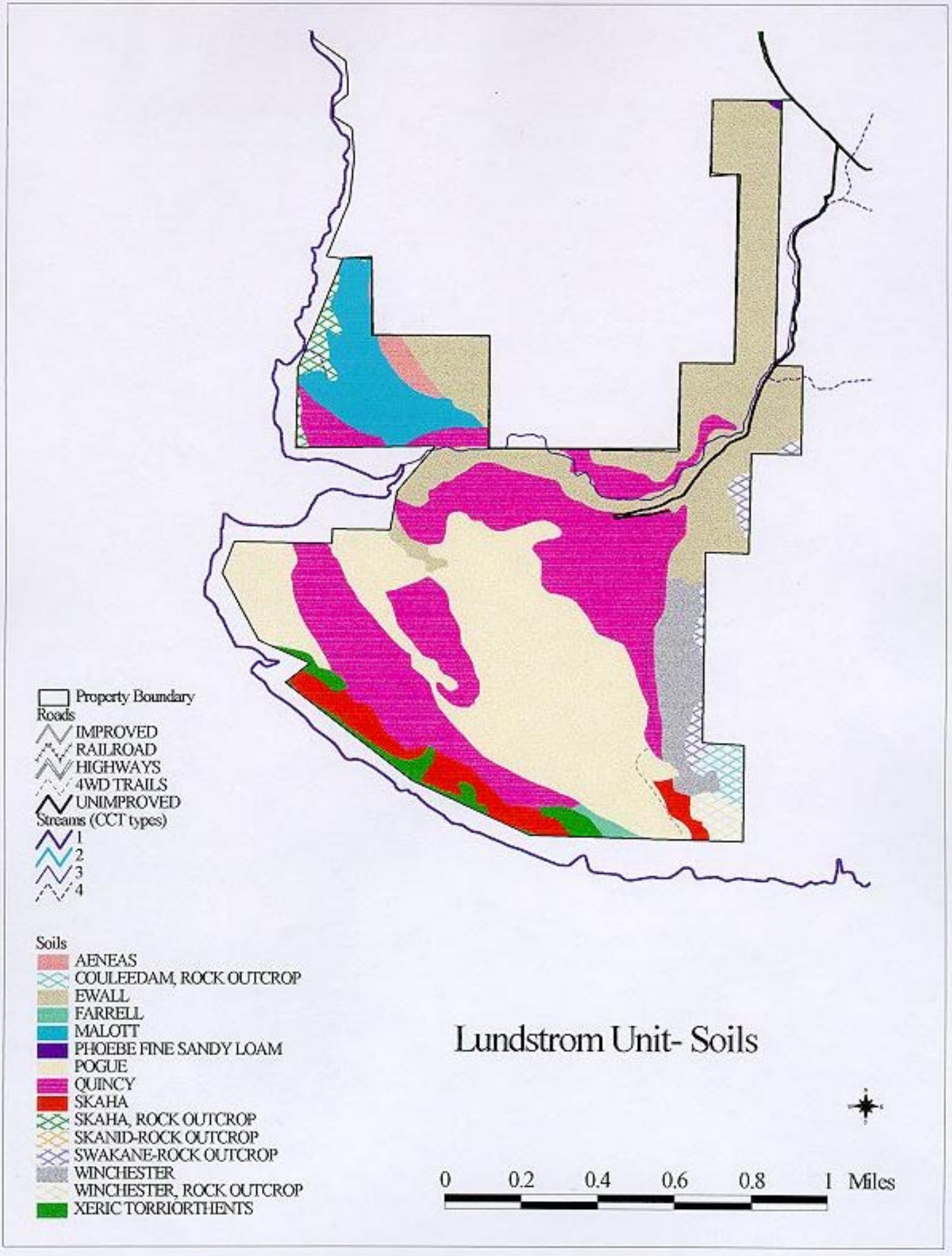
ROCK COVER (1 acre)
This area is a rock outcrop with a few species similar to the surrounding cover type. This is due to the lack of deep soils. Grasses, mainly three-awn with little or no shrubs cover the area. No active management is scheduled for this area other than weed control. There is enough seed source from the surrounding cover types to maintain the grasses and forbs on this site.

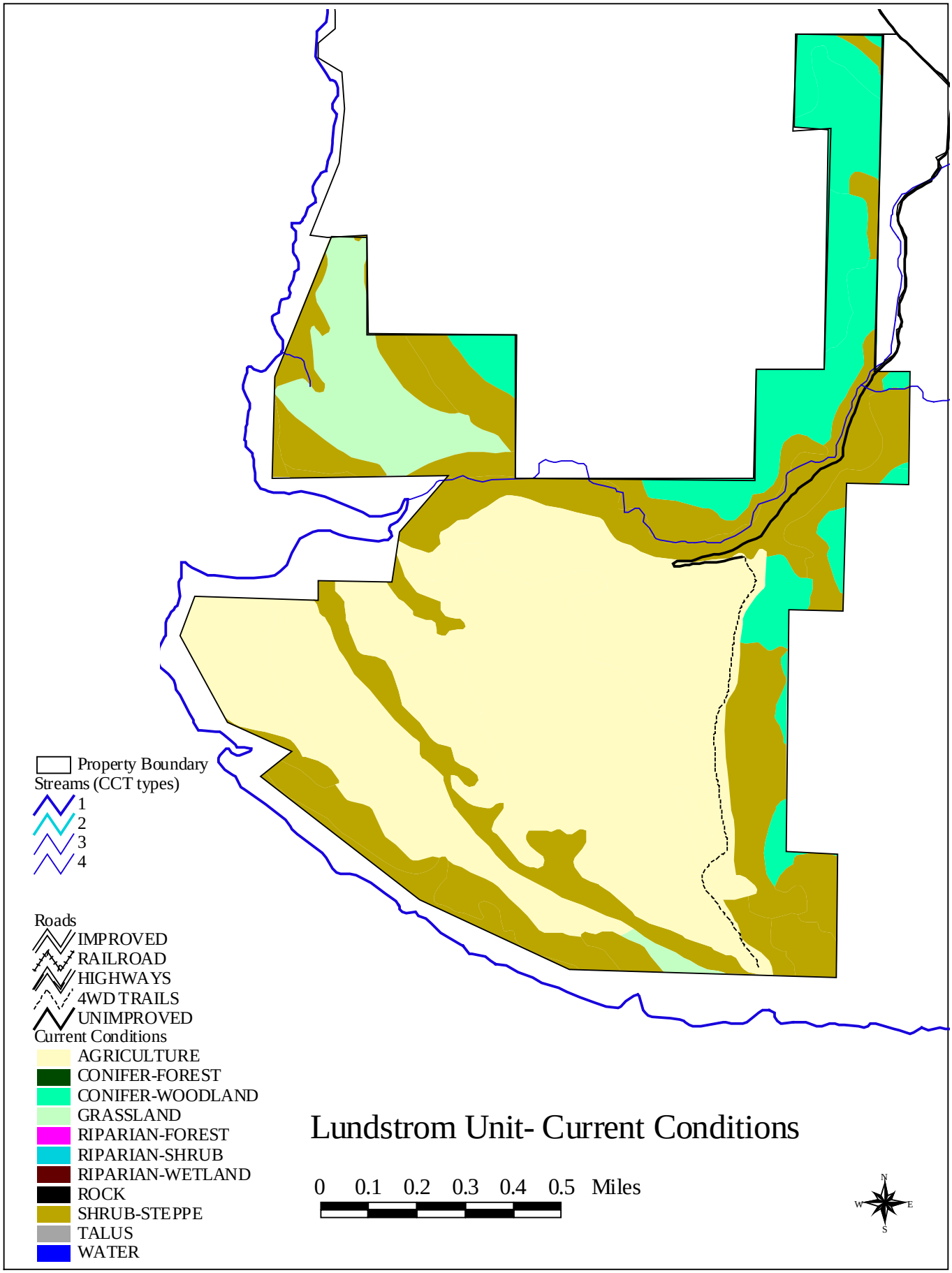
Table 15. Current and desired future cover types, HEP species and results for the Lundstrom Unit.

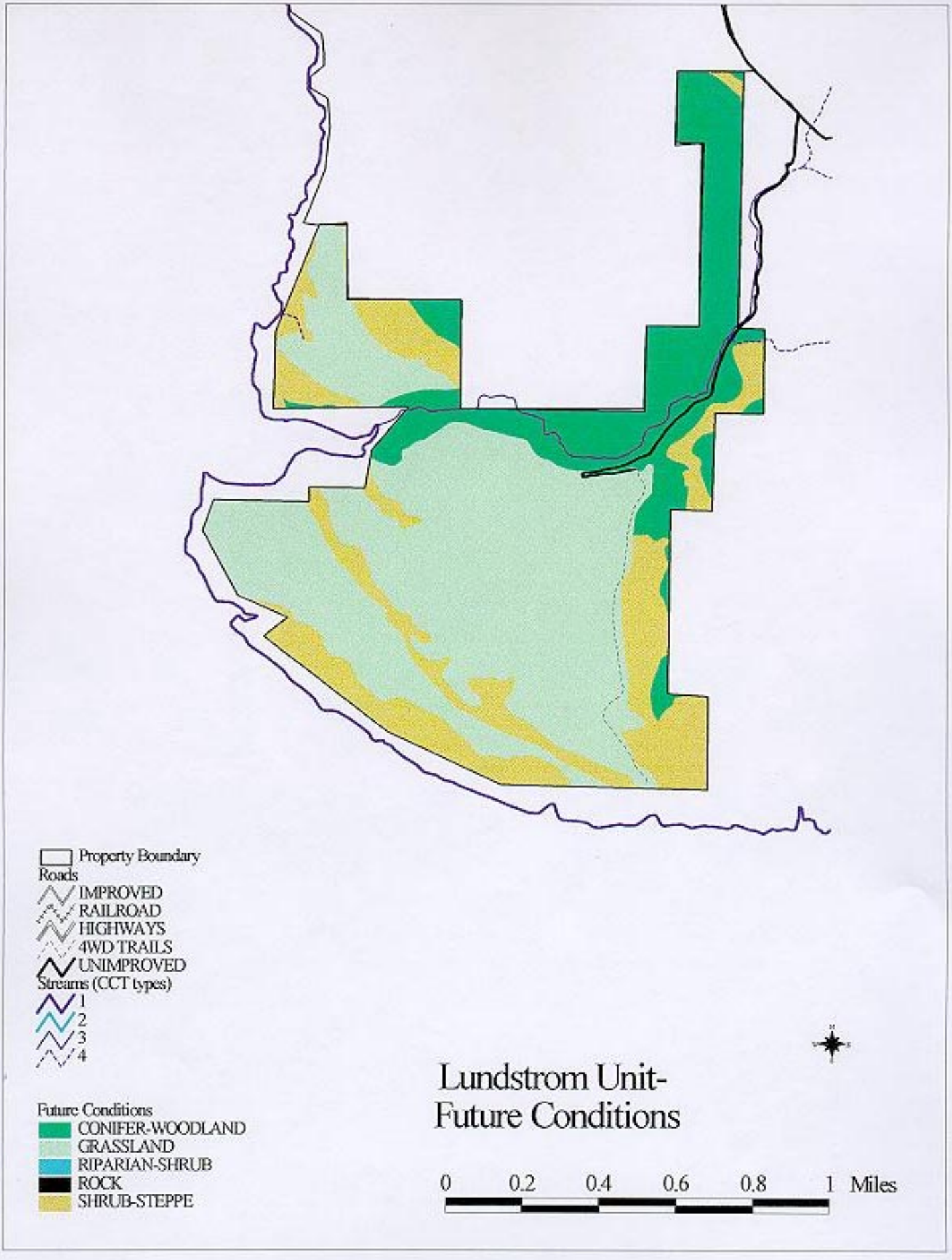
Cover Type	HEP Species	HSI	Acres	HU's
CURRENT CONDITIONS				
Agriculture	Mourning Dove	0.5	433	216
Forested Wetland	Downy Woodpecker	0.8	80	64
Conifer Woodland	Mule Deer	0.5	150	75
Rock	Bobcat	0.6	1	1
Shrub-steppe	Sharp-tailed Grouse	0.6	177	106
Shoreline	Canada Goose	0.2	18	4
Riverine	Mink	0.3	10	3
FUTURE CONDITIONS				
Grassland	Mourning Dove	0.6	433	260
Forested Wetland	Downy Woodpecker	0.8	80	64
Conifer Woodland	Mule Deer	0.6	150	90
Rock	Bobcat	0.6	1	1
Shrub-steppe	Sharp-tailed Grouse	0.6	177	106
Shoreline	Canada Goose	0.4	18	7
Riverine	Mink	0.4	10	4

Figure 35 shows the current conditions for this unit and future conditions are shown in Figure 36.


Property Boundary
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Contours (40ft.[E])
Lundstrom Unit- Topography
0
0.2
0.4
0.6
0.8
1 Miles


Property Boundary
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Soils
AENEAS
COULEEDAM, ROCK OUTCROP
EWALL
FARRELL
MALOTT
PHOEBE FINE SANDY LOAM
POGUE
QUINCY
SKAHA
SKAHA, ROCK OUTCROP
SKANID-ROCK OUTCROP
SWAKANE-ROCK OUTCROP
WINCHESTER
WINCHESTER, ROCK OUTCROP
XERIC TORRIORTHENTS
Lundstrom Unit- Soils
0 0.2 0.4 0.6 0.8 1 Miles


Property Boundary
Streams (CCT types)
1
2
3
4
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Current Conditions
AGRICULTURE
CONIFER-FOREST
CONIFER-WOODLAND
GRASSLAND
RIPARIAN-FOREST
RIPARIAN-SHRUB
RIPARIAN-WETLAND
ROCK
SHRUB-STEPPE
TALUS
WATER
Lundstrom Unit- Current Conditions
0 0.1 0.2 0.3 0.4 0.5 Miles
N
W
E
S


Property Boundary
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Future Conditions
CONIFER-WOODLAND
GRASSLAND
RIPARIAN-SHRUB
ROCK
SHRUB-STEPPE
Lundstrom Unit-
Future Conditions
0
0.2
0.4
0.6
0.8
1 Miles

Simons Management Unit

This land was purchased from William Kuehne in 1993. The parcel consists of 615 acres of forested and rangeland habitats. The land lies below and southeast of Johnny George Mountain within the Hellsgate Reserve (Figure 37). The Simons family farmed the land and produced dryland wheat from the 30" until the late 50's when William Kuehne purchased the land. The forested areas were logged, prior to change in ownership removing the large Ponderosa pine overstory. Two springs are located within the Property boundary as well as the upper intermittent reaches of George creek. The Simons family settled near the lower field by George creek and built a large barn, outbuildings, and living quarters (some of these structures are still standing). Domestic water was supplied by piping water from George creek to the house. William Kuehne utilized the land for dryland wheat and cattle grazing. In 1987 the wheat growing areas (260 acres) were placed into the Conservation Reserve Program (CRP) for a period of ten years. To protect the two CRP fields they were fenced and cattle guards were installed on the main road to prevent livestock trespass. Over the years that followed little or no maintenance was done to the fencelines. When the land was purchased for mitigation, the fences were in poor shape and noxious weed patches occurred in the CRP grass mix (crested and intermediate wheatgrass and Ladack alfalfa). In 1998 the upper and lower field were signed up for CRP for the next ten years and the fences were mended. In 1995, the Johnny George logging sale took place and the cattle guards were filled with sediments from the logging truck traffic. This allowed livestock trespass to occur. Hellsgate Project personnel maintain the boundary fences and new fences were constructed on both sides of the main road to keep livestock out of the CRP fields. This Unit lies within Range Unit 78, which until the fall of 1996 was open to livestock grazing. There are 174 acres of conifer forest on the upper portion of the property. Ponderosa pine / snowberry / Idaho fescue are the dominant plant association group on another 84 acres. In openings between forested areas (78 acres), bitterbrush occurs as the dominant shrub with understory vegetation of cheatgrass and noxious weeds. The riparian cover type containing 19 acres lies along the intermittent drainage bisecting the north half of the unit.

Soils

The well-drained soils of the area are mostly silty to gravely loam (Figure 38). The soils of the upper CRP field are composed of Broadax silt loam in which non-irrigated wheat and barley were grown. These Broadax soils are good for desired perennial grass/forb cover and will support scattered Ponderosa pine and/or Douglas fir with bitterbrush over Idaho fescue or bluebunch wheatgrass. Soils of the lower field are dryer and composed of Phoebe fine sandy loam and George creek silts that are more suited for forest PAGs. These soils support Ponderosa pine with an understory of snowberry, assorted forbs and pine grass.

Management Goals for this unit:

This unit has high potential as winter range for both deer and elk. The open fields are enrolled into CRP and will be maintained until the end of the contract period. At the end of that time the lower field will be allowed to fill in with conifers and become conifer woodland cover type. The upper field will be maintained as shrub-steppe with desired grasses and forbs. The conifer forest bordering the open areas will be maintained for forest health and mature growth. Livestock will be excluded from this unit and boundary fences maintained.

Short-term Management Goals

- Continue the CRP for the next ten years (1997 – 2007).
- Plant shrubs within the CRP fields.
- Develop the springs on the site for wildlife use.
- Maintain noxious weed control over the entire area.
- Maintain the fence boundaries, roads, signs, and some of the existing structures.
- Maintain and/or plant cultural vegetation where possible.

Long-term Management Goals:

- Maintain boundary fences, gates and informational signs.
- Maintain the upper field in desirable shrubs, grasses and forbs (shrub-steppe).
- Allow the lower field to change back to conifers over time (conifer woodland).
- Maintain and enhance the bitterbrush, Idaho fescue/ bluebunch wheatgrass within the shrub-steppe cover type.
- Manage the conifer forest cover type for mature and old growth ponderosa pine.
- Restore and enhance the two springs for wildlife use.
- Maintain the buildings on the unit or demolish them if they become a public hazard.
- Maintain at least 6 snags per acre, 2 greater than 20" dbh on the coniferous forest cover type.

AGRICULTURAL COVER (260 acres)

Currently this cover type is enrolled into CRP and will be maintained and enhanced for the next ten years. The cover type occurs as two large fields containing different soil types. The upper field soils will support PIPO/PUTR/AGSP the habitat type, while the lower field was PIPO/AGSP habitat. Sharp-tailed grouse was used to evaluate this cover type which rated low due to lack of nesting cover and foraging areas. When the CRP contract is finished in the year 2007 the lower field will be allowed to return to conifer woodland and the upper field will become shrub-steppe. Maintain CRP contracts and plant suitable grasses and forb species for diversity, food and cover. Allow natural regeneration of shrubs/trees to occur in the CRP fields.

CONIFER FOREST COVER (174 acres)

- Maintain a mature multistory Ponderosa pine overstory.
- Maintain the overall pine canopy closure around 70%.
- Blue grouse was used to evaluate this cover type, which rated high (0.9) because of the abundant food and cover

CONIFER WOODLAND (84 acres)

- Mule deer was used to evaluate this cover type (0.5).
- Maintain a mature multistory Ponderosa pine overstory.
- Maintain the overall pine canopy closure around 10%.

SHRUB-STEPPE COVER (78 acres)

- Mule Deer was used to evaluate this area which rated 0.5.
- Maintain pockets of bitterbrush and sage to create edge habitats in or near the grassland habitats.

- Plant deciduous shrubs where applicable throughout the area.
- Maintain the shrub community for size class and palatability for deer and elk.

RIVERINE COVER (19 acres)
Mink was used to evaluate the riparian habitat that rated 0.3.
There is very little riverine habitat suitable on this unit for riparian obligate species because Johnny George creek is intermittent. The riparian areas will be enhanced to support shrub wetland vegetation (stands of aspen) in drier areas and cottonwood, alder, water birch in areas with surface water.

Table 16. Current and desired future cover types, HEP species and results for the Simons Unit.

Cover Type	HEP Species	HSI	Acres	HU's
CURRENT CONDITIONS				
Agriculture	Sharp-tailed Grouse	0.4	260	104
Conifer Forest	Blue Grouse	0.9	174	157
Conifer Woodland	Mule Deer	0.5	84	42
Shrub-steppe	Mule Deer	0.5	78	39
Riverine	Mink	0.3	19	6
FUTURE CONDITIONS				
Conifer Forest	Blue Grouse	0.9	174	157
Conifer Woodland	Mule Deer	0.6	184	42
Shrub-steppe	Mule Deer	0.6	237	130
Shrub Wetland	Yellow Warbler	0.5	20	10

Figure 39 shows the current conditions for this unit and future conditions are shown in Figure 40.

Contours (40ft.[E])

Roads

IMPROVED

RAILROAD

HIGHWAYS

4WD TRAILS

UNIMPROVED

Streams (CCT types)

1

2

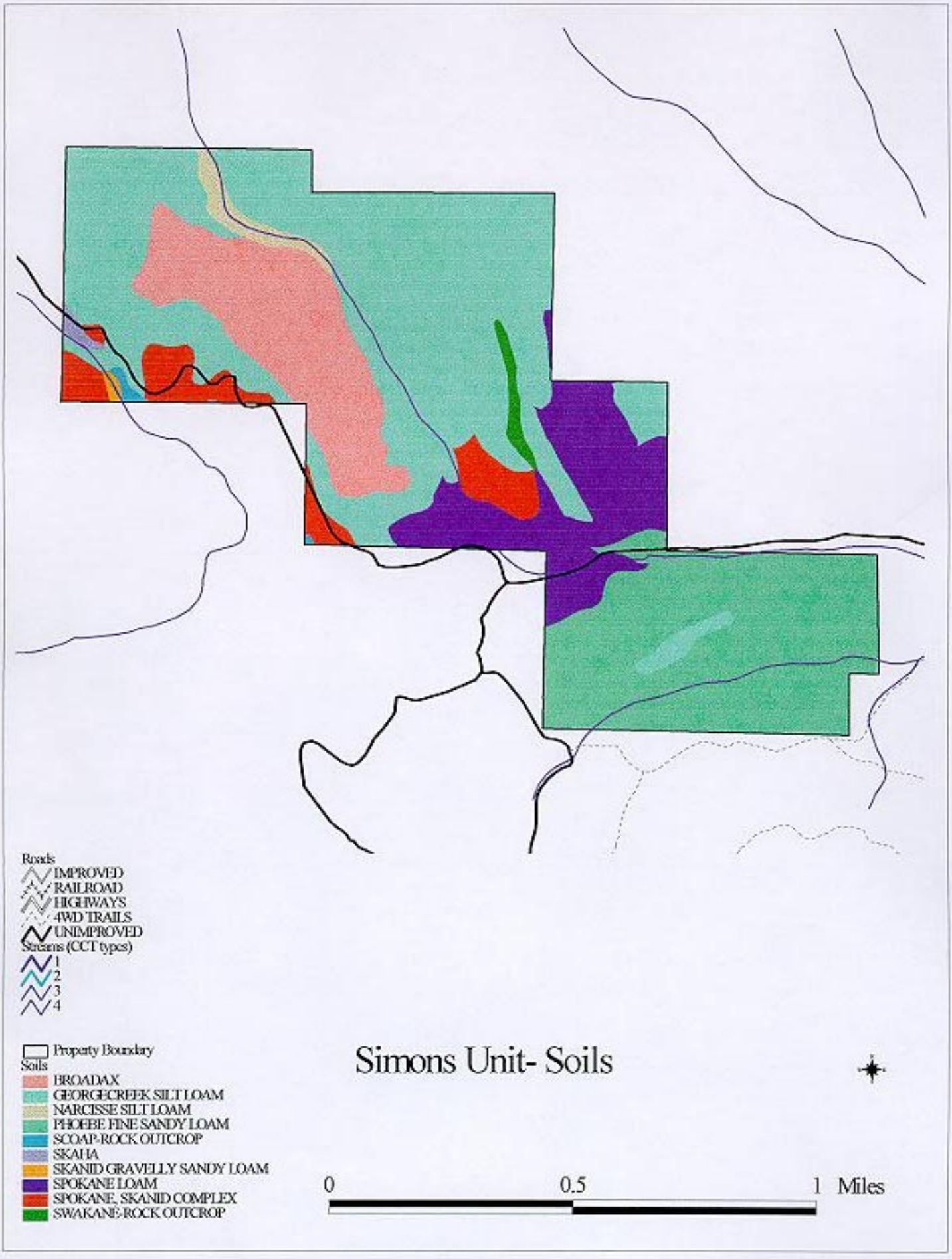
3

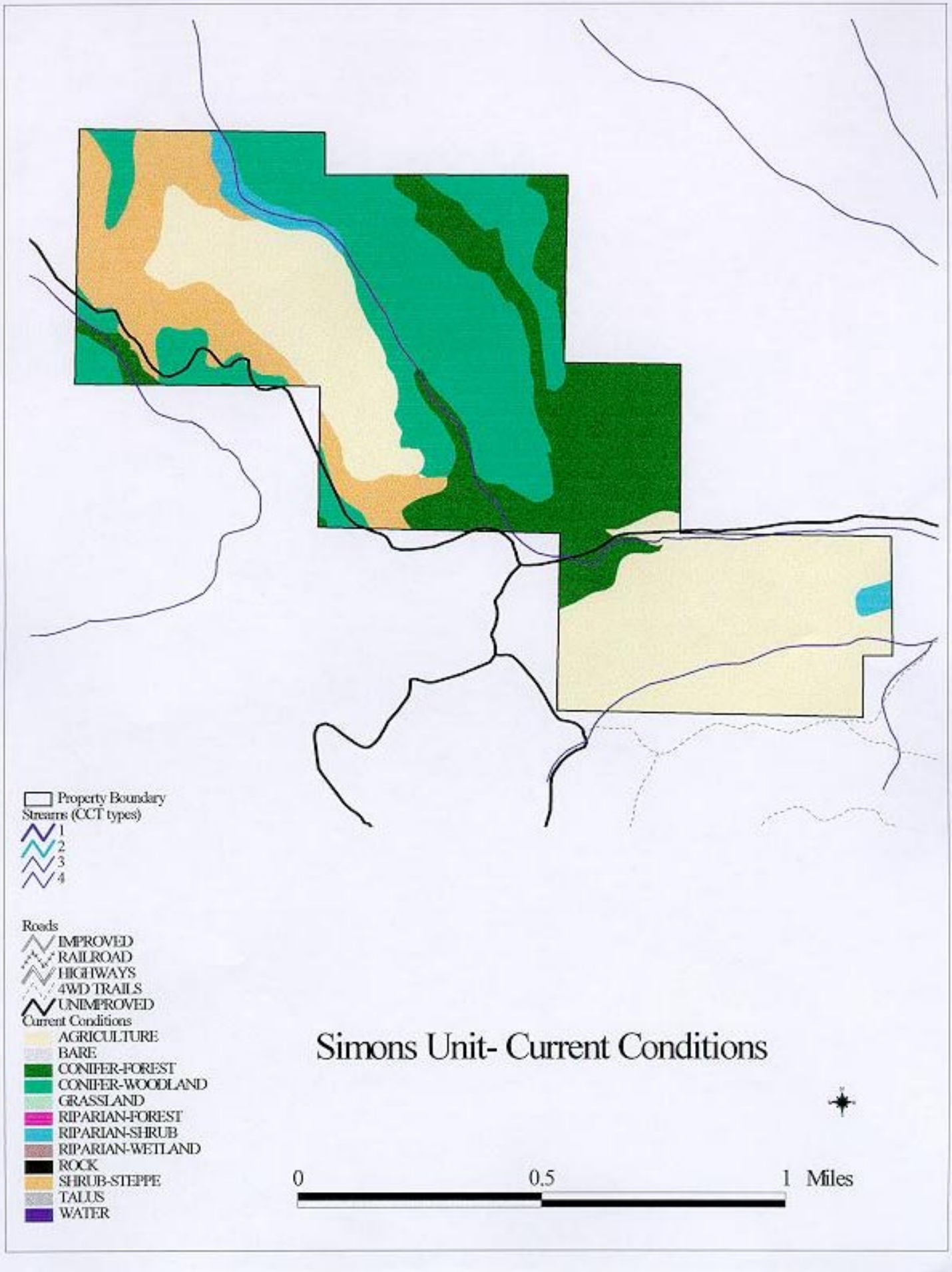
4

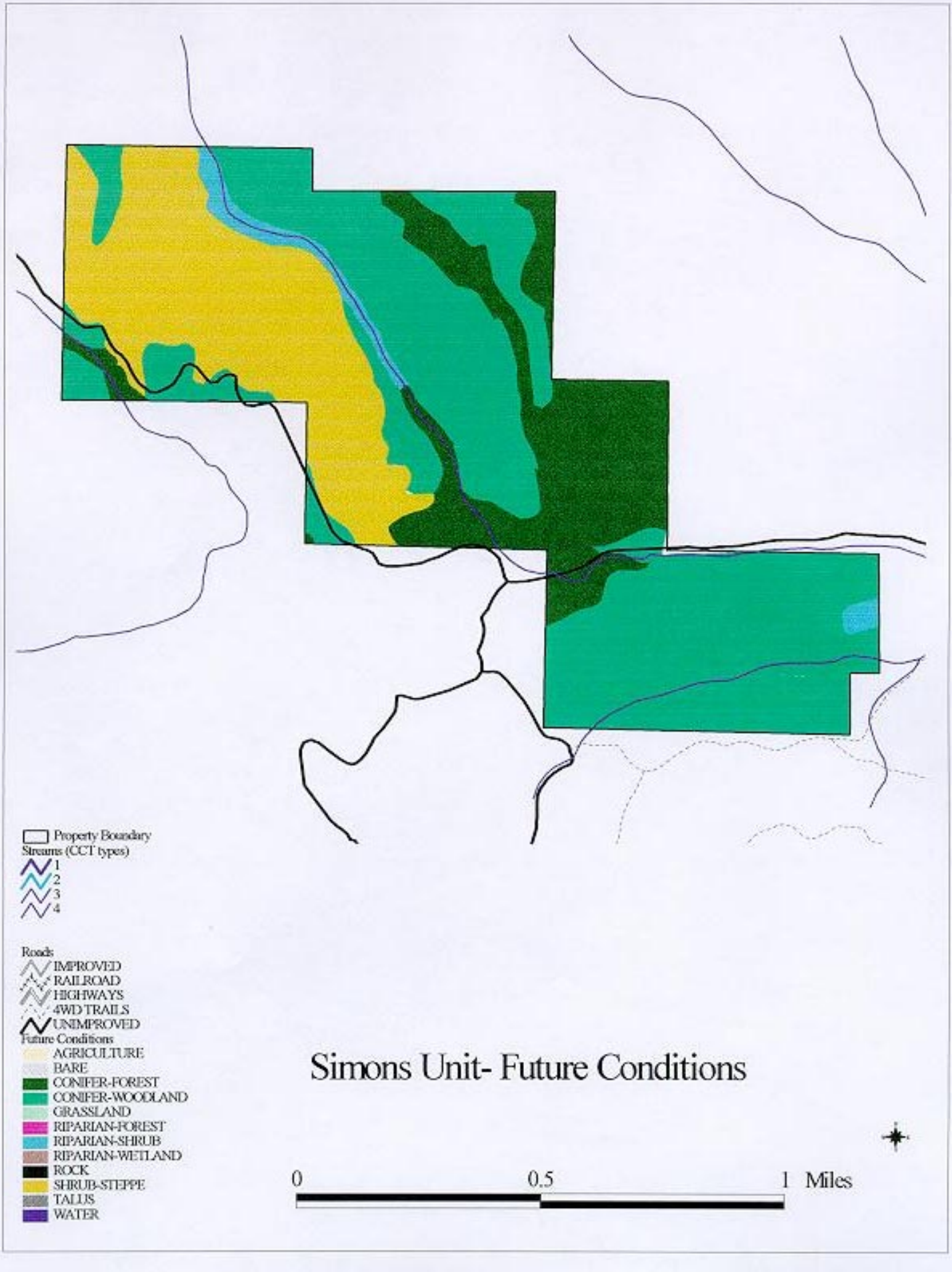
Property Boundary

Simons Unit- Topography

0 0.5 1 Miles


Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Property Boundary
Soils
BROADAX
GEORGECREEK SILT LOAM
NARCISSE SILT LOAM
PHOEBE FINE SANDY LOAM
SCOAP-ROCK OUTCROP
SKAHA
SKANID GRAVELLY SANDY LOAM
SPOKANE LOAM
SPOKANE, SKANID COMPLEX
SWAKANE-ROCK OUTCROP
Simons Unit- Soils
0
0.5
1 Miles


Property Boundary
Streams (CCT types)
1
2
3
4
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Current Conditions
AGRICULTURE
BARE
CONIFER-FOREST
CONIFER-WOODLAND
GRASSLAND
RIPARIAN-FOREST
RIPARIAN-SHRUB
RIPARIAN-WETLAND
ROCK
SHRUB-STEPPE
TALUS
WATER
Simons Unit- Current Conditions
0
0.5
1 Miles


Property Boundary
Streams (CCT types)
1
2
3
4
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Future Conditions
AGRICULTURE
BARE
CONIFER-FOREST
CONIFER-WOODLAND
GRASSLAND
RIPARIAN-FOREST
RIPARIAN-SHRUB
RIPARIAN-WETLAND
ROCK
SHRUB-STEPPE
TALUS
WATER
Simons Unit- Future Conditions
0
0.5
1 Miles

Friedlander Management Unit.
This unit contains six separate parcels located along Friedlander meadows in the Hellsgate Reserve (Figure 41). The meadows contain grassland and riparian habitats while the uplands are dominated by coniferous forest habitat (760 acres total). A few of the separate parcels are fenced. This area of the Reservation is open range and the riparian and meadow areas are grazed throughout the season. Grazing has altered the composition and growth of grass, forb, tree and shrub species found in the area. Cheatgrass, annuals and noxious weeds have replaced native vegetation over most of the area. Roads, skid-trails, downed logs and stumps are evidence of past logging on these parcels. Management actions such as boundary fencing, stream bank protection from livestock, planting desired trees and shrubs, and weed control will eliminate some of the impacts from the past and allow habitats to recover over time. Planting the banks with suitable species and adding large organic debris to the stream channel will prevent further stream bank erosion. The south fork of Nine-Mile creek runs through the entire length of Friedlander Meadow. The parcels within this watershed are Douglas fir habitat types (PSME) with a component of riparian-shrub vegetation on the wetter sites. The land rises steeply upward on both sides of the meadow. These slopes are covered with trees. There are Ponderosa and lodgepole pine and a few larches, but Douglas fir is the dominant species.

Soils
The soils of this unit are silt loam deposits (Figure 42).

Management Goals for this unit:
To maintain the conifer forest habitat for mature growth of P. pine and fir.
To protect, enhance and maintain the riparian wetland habitat.

Short-term Management Goals:
- Construct new boundary fences for the parcels.
- Control noxious weeds over the entire area.
- Seed the open areas to desired grasses and forbs.
- Enhance and restore the riparian corridor along the creek.
- Promote a healthy forest ecosystem.

Long-term Management Goals:
- Rehabilitate Friedlander Meadows to desired vegetation and maintain.
- Promote mature stands of fir and P. pine surrounding the meadow.

Monitoring and Evaluation Activities:
- Wildlife population trends and Habitat use.
- Vegetative community composition, succession stage and associated changes.
- Noxious weed control applications.
- Monitor cultural and subsistence use of the area.
- Monitor habitat component abundance and use (cavities, snags, etc.,).

GRASSLAND / AGRICULTURAL COVER (48 acres)
- Control noxious weeds and unwanted species.

- Maintain PIPO/FEID habitat type grasses and forb species for diversity, food and cover.

CONIFER FOREST COVER (686 acres)
- Maintain a mature multistory Ponderosa pine overstory.
- Maintain the overall canopy closure around 70%.
- Maintain at least 6 snags per acre, 2 greater than 20" dbh.
- Thin areas when necessary to promote forest health and/or maintain desired canopy closure.

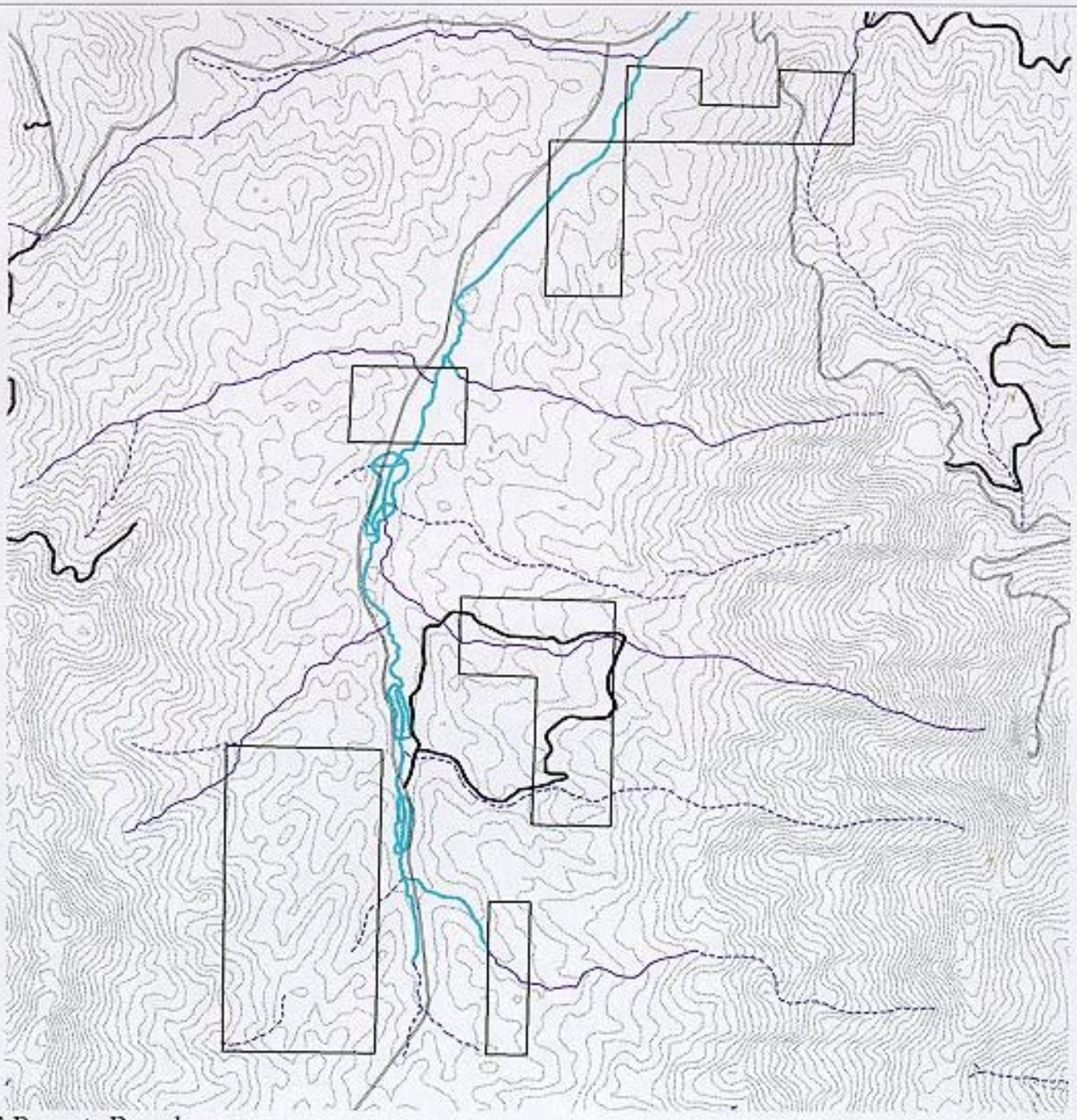
RIVERINE COVER (26 acres)
- Increase the pool to riffle ratios along the creek for diversity.
- Enhance wetland vegetation.
- Plant suitable shrub and tree species.

Maintain the perimeter fences to protect this unit from livestock trespass.

Table 17. Current and desired future cover types, HEP species and results for the Friedlander Unit.

Cover Type	HEP Species	HSI	Acres	HU's
CURRENT CONDITIONS				
Conifer Forest	Downy Woodpecker	0.8	686	549
Grassland/Agriculture	Mourning Dove	0.5	48	24
Riverine	Mink	0.3	26	8
FUTURE CONDITIONS				
Conifer Forest	Downy Woodpecker	0.8	686	549
Conifer Woodland	Mourning Dove	0.6	48	29
Riverine	Mink	0.5	26	13

Figure 43 shows the current conditions for this unit and future conditions are shown in Figure 44.



Property Boundary

Roads

IMPROVED

RAILROAD

HIGHWAYS

4WD TRAILS

UNIMPROVED

Streams (CCT types)

1

2

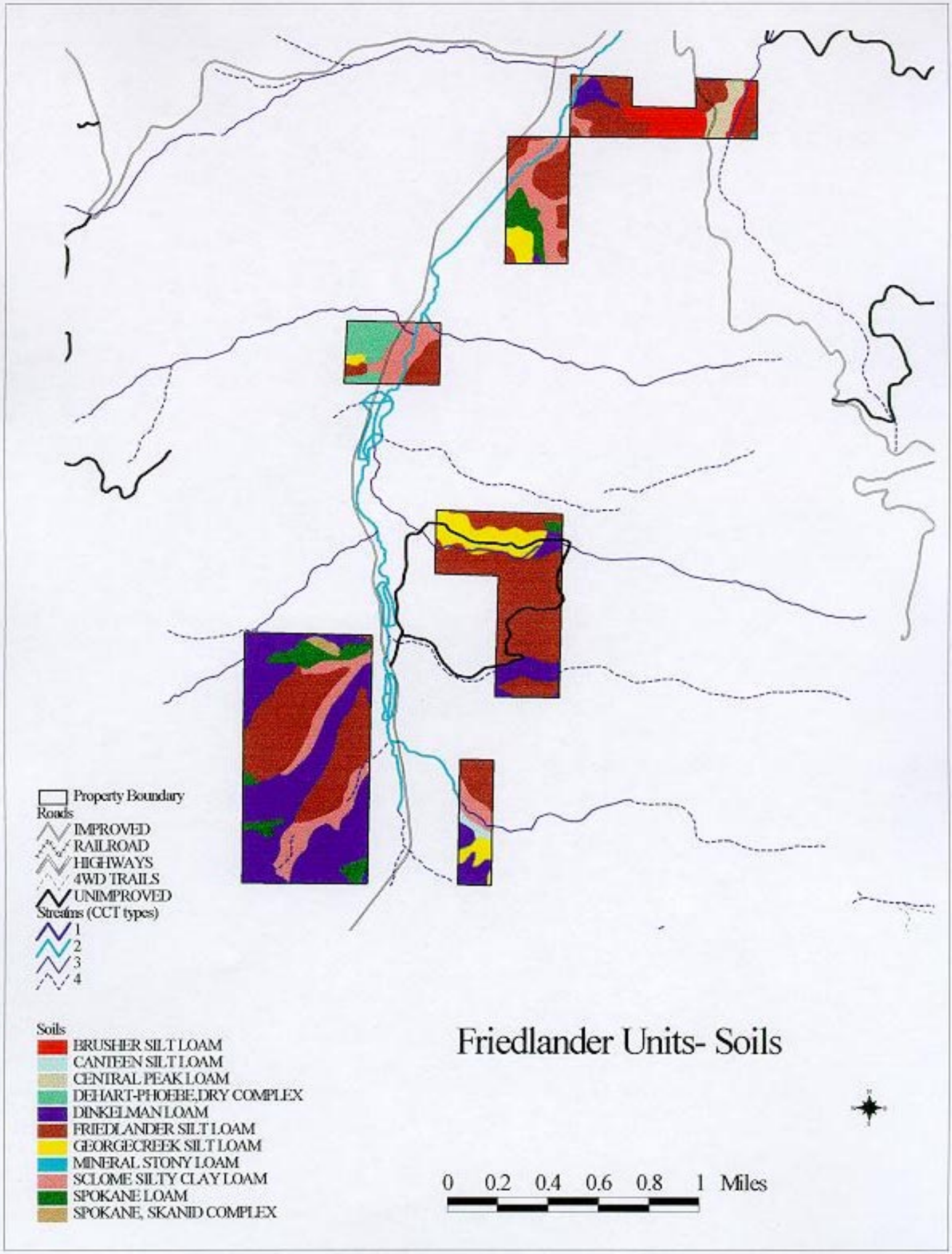
3

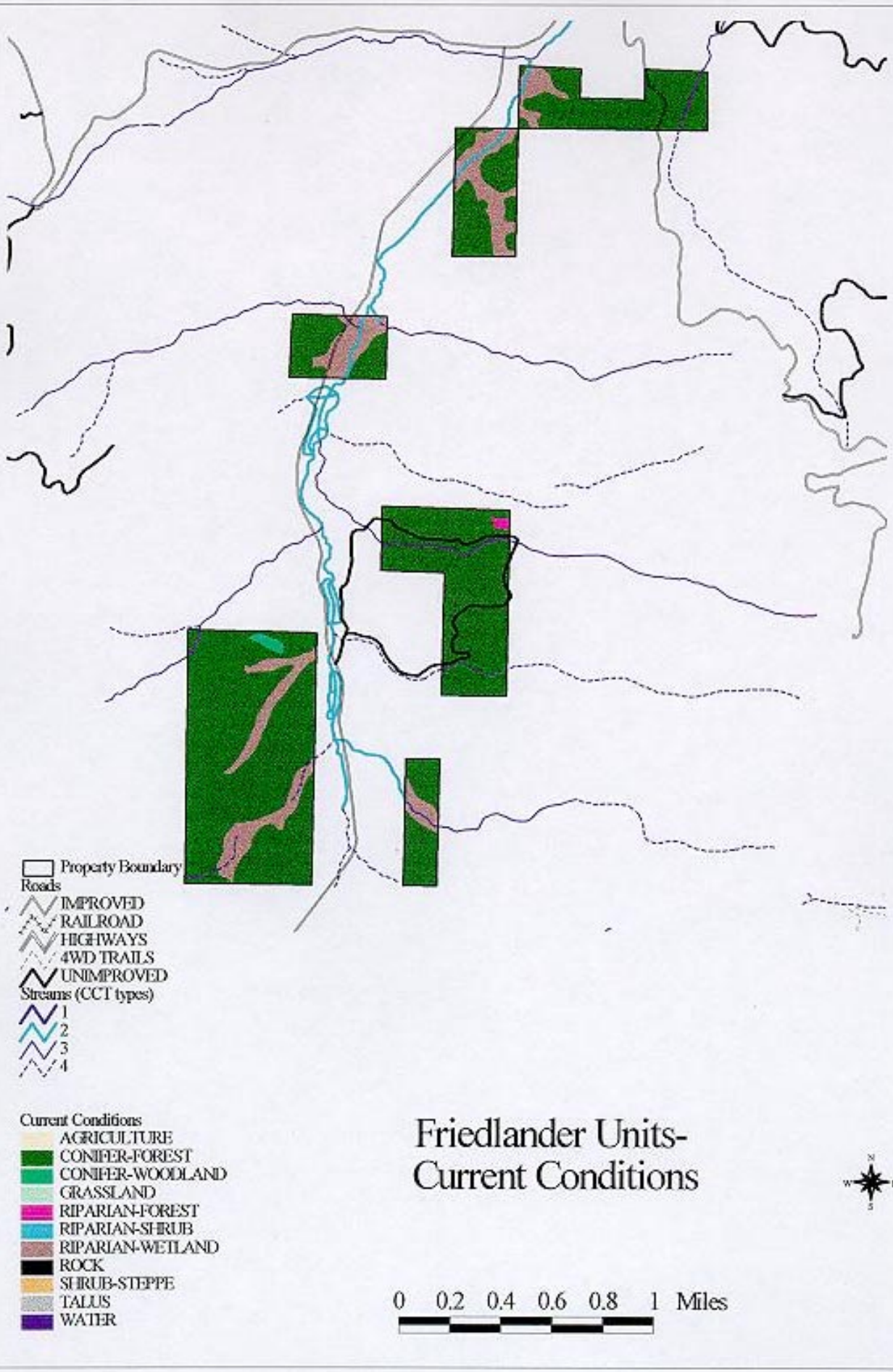
4

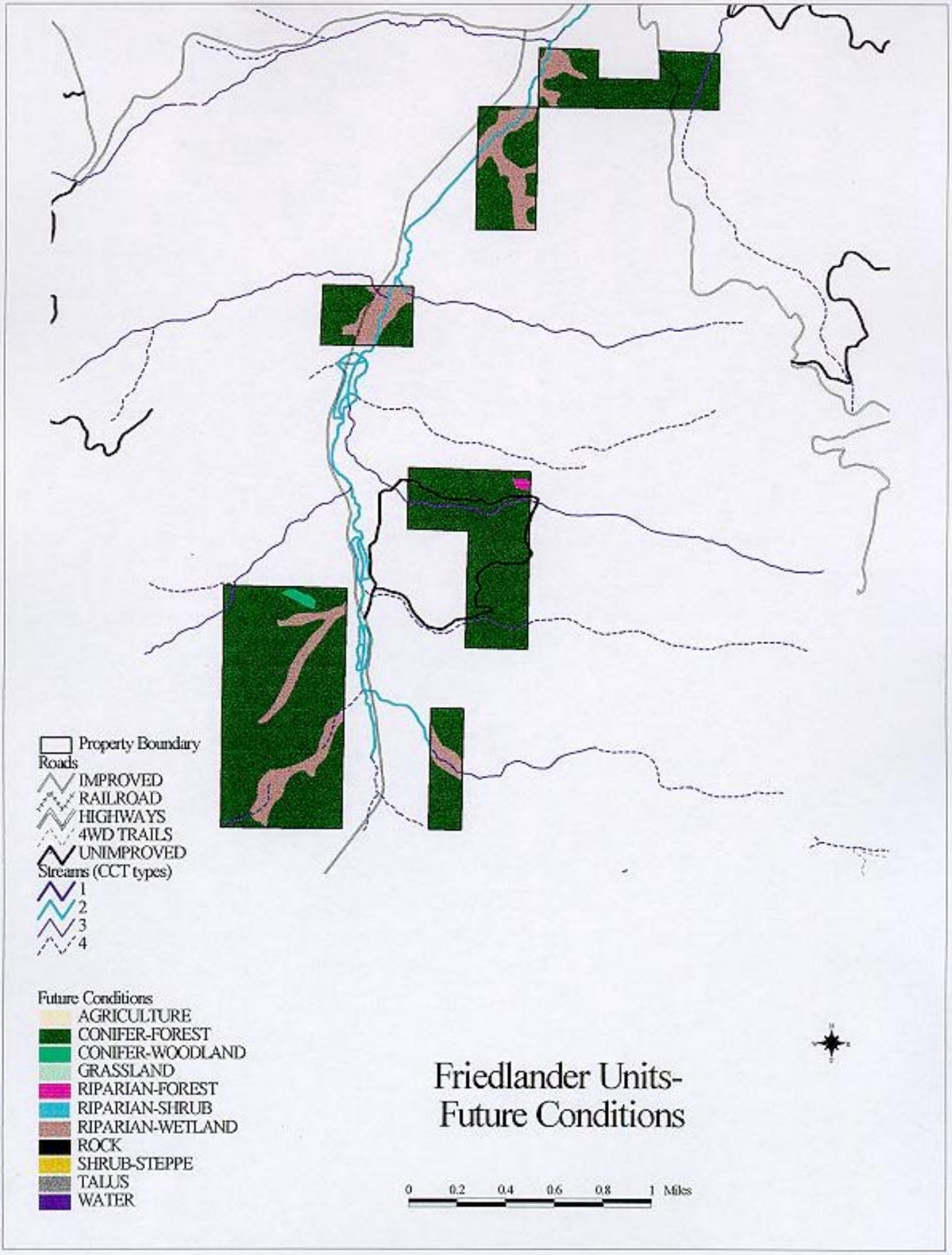
Contours (40ft.[E])

Friedlander Units- Topography

0 0.2 0.4 0.6 0.8 1 Miles


Property Boundary
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Soils
BRUSHER SILT LOAM
CANTEEN SILT LOAM
CENTRAL PEAK LOAM
DEHART-PHOEBE,DRY COMPLEX
DINKELMAN LOAM
FRIEDLANDER SILT LOAM
GEORGECREEK SILT LOAM
MINERAL STONY LOAM
SCLOME SILTY CLAY LOAM
SPOKANE LOAM
SPOKANE, SKANID COMPLEX
Friedlander Units- Soils
0 0.2 0.4 0.6 0.8 1 Miles


Property Boundary
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Current Conditions
AGRICULTURE
CONIFER-FOREST
CONIFER-WOODLAND
GRASSLAND
RIPARIAN-FOREST
RIPARIAN-SHRUB
RIPARIAN-WETLAND
ROCK
SHRUB-STEPPE
TALUS
WATER
Friedlander Units-
Current Conditions
N
W
E
S
0 0.2 0.4 0.6 0.8 1 Miles


Property Boundary
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Streams (CCT types)
1
2
3
4
Future Conditions
AGRICULTURE
CONIFER-FOREST
CONIFER-WOODLAND
GRASSLAND
RIPARIAN-FOREST
RIPARIAN-SHRUB
RIPARIAN-WETLAND
ROCK
SHRUB-STEPPE
TALUS
WATER
Friedlander Units-
Future Conditions
0 0.2 0.4 0.6 0.8 1 Miles

Sclome Management Unit.
This Unit consists of 120 acres of mostly forested land with an intermittent creek running north and south through the eastside of the property (Figure 45). An old logging road paralleling the creek gives access to the site. The unit has never been fenced and lies within Range Unit 21. Season long grazing has changed the vegetative community in the area. The riparian corridor along the creek lacks typical riparian shrub and tree species. There are no cottonwood or aspens growing in the area, but old tree stumps and evidence of an old beaver pond suggests that they were present some time in the past. The hawthorns that line the riparian areas are clumped and hedged. The site is mostly dry due to the lowered water table and lacks diversity of species associated with wetland habitats. Noxious weeds (Houndstounge and knapweed) and cheat grass cover most of the open grassland areas. The previous owner logged the forested areas in the past, prior to selling the land for mitigation. Livestock continue to graze this site every year during the grazing season because there are no boundary fences in place.

Soils
There are four main soil types on this unit, mostly silty loam (Figure 46). The upland soils are deep, well drained and formed from weathered granite or volcanic rock with an ash cap. These soils occur on the toe and footslopes of ridges and the typical vegetation is an overstory of Ponderosa pine or Douglas fir with an understory of snowberry, ninebark and/or oceanspray over pinegrass and spirea. The valley areas contain silty clay loam soils formed from fine alluvium over ash and fill. These soils are very deep and poorly drained and support aspen and birch plant associations.

Management Goals for this unit:
Increase the amount of riparian habitat on this unit.
Protect and enhance the stands of deciduous trees/shrubs within the riparian cover type.
Manage for mature stands of pine and fir within the coniferous forest habitat type.

Short-term Management Goals:
- Construct boundary fences to prevent livestock trespass.
- Control the patches of noxious weeds found on the area.
- Seed the treated and bare ground areas to desired grasses and forbs.
- Enhance and restore the riparian corridor along the creek.
- Maintain the forest canopy cover greater than 30 % over the entire area.
- Plant deciduous trees and shrubs within the riparian cover type.

Long-term Management Goals:
- Maintain the boundary fences on the unit.
- Develop and maintain a mature stand of aspen and /or birch in the riparian cover type on this unit.
- Maintain desired understory vegetation within the riparian and conifer forest cover types.
- Maintain a mature multistory Ponderosa pine overstory.
- Maintain the overall canopy closure of P. pine and fir greater than 30% on the uplands.
- Maintain at least 6 snags per acre, 2 greater than 20” dbh.

Monitoring and Evaluation:

- Wildlife population trends and Habitat use.
- Vegetative community composition, succession stage and associated changes.
- Noxious weed control applications.
- Monitor cultural and subsistence use of the area.
- Monitor habitat component abundance and use (cavities, snags, etc.,).

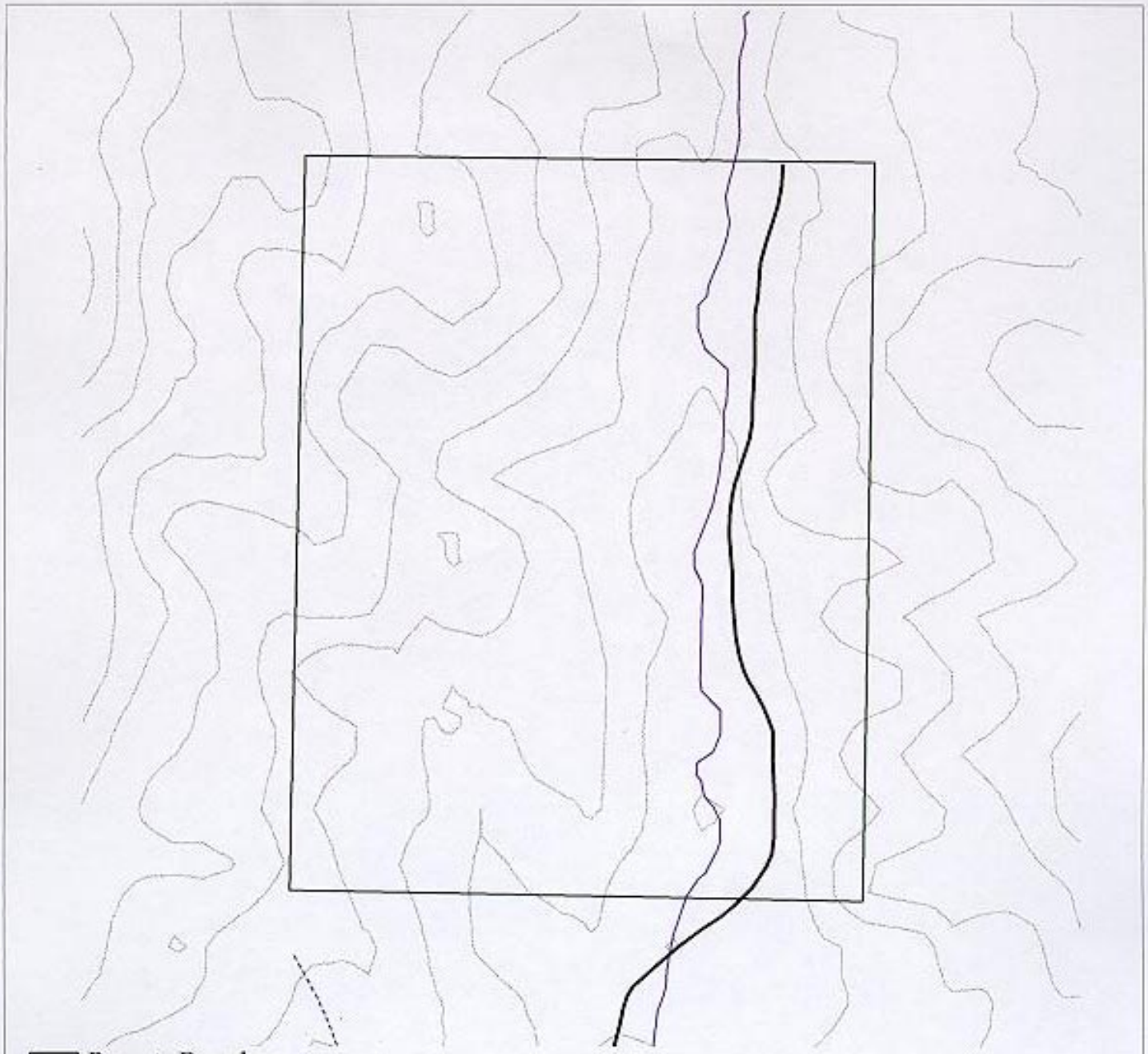
Present Cover Types and Acres:
CONIFER FOREST COVER (112 acres)
This area contains a mix of P. pine and Douglas fir on a southeast aspect. This area was logged a few years before the unit was purchased for mitigation. The large trees were selected leaving a stand of small (6 to18" DBH) trees of similar age. Understory vegetation is mainly ninebark, oceanspray and snowberry with pine grass. The Blue grouse model was used to evaluate this habitat type. The habitat rated fairly high for this species because the open stand of pine and fir allowed a release of understory vegetation preferred by this species. Over time this cover type will become limiting for blue grouse as the understory vegetation matures and the overstory stand closes up.

RIVERINE COVER (8 acres)
The riparian area is degraded due to season long grazing impacts. The soils of this cover type will support the expansion of this type to 30 acres. This type lacks overstory cover and diversity of tree/shrub species. The mink model was used to evaluate this type. The HSI rated 0.3 because of lack of reproductive cover and food. Protecting and enhancing this cover type should increase the value of the habitat for the mink. Growing cottonwood and aspen in suitable soils will benefit other species such as white-tailed deer, ruffed grouse, and neo-tropical birds that use riparian areas for life requirements.

Table 18. Current and desired future cover types, HEP species and results for the Sclome Unit.

Cover Type	HEP Species	HSI	Acres	HU's
CURRENT CONDITIONS				
Conifer Forest	Blue Grouse	0.8	112	90
Riverine	Mink	0.3	8	2
FUTURE CONDITIONS				
Conifer Forest	Blue Grouse	0.8	90	72
Riverine	Mink	0.5	30	15

Figure 47 shows the current conditions for this unit and future conditions are shown in Figure 48.



Property Boundary

Roads

IMPROVED

RAILROAD

HIGHWAYS

4WD TRAILS

UNIMPROVED

Streams (CCT types)

1

2

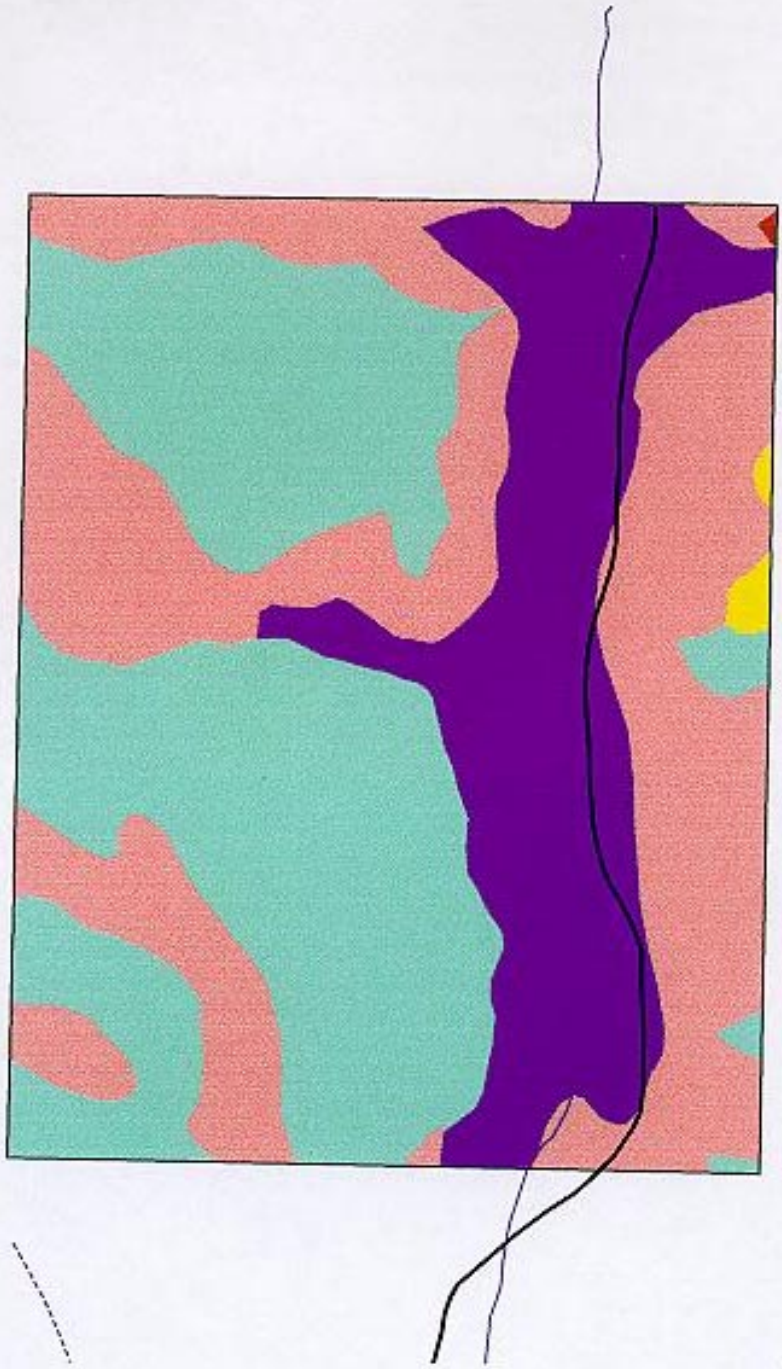
3

4

Contours (40ft.[E])

Sclome Unit- Topography

0 0.1 0.2 0.3 Miles



Property Boundary

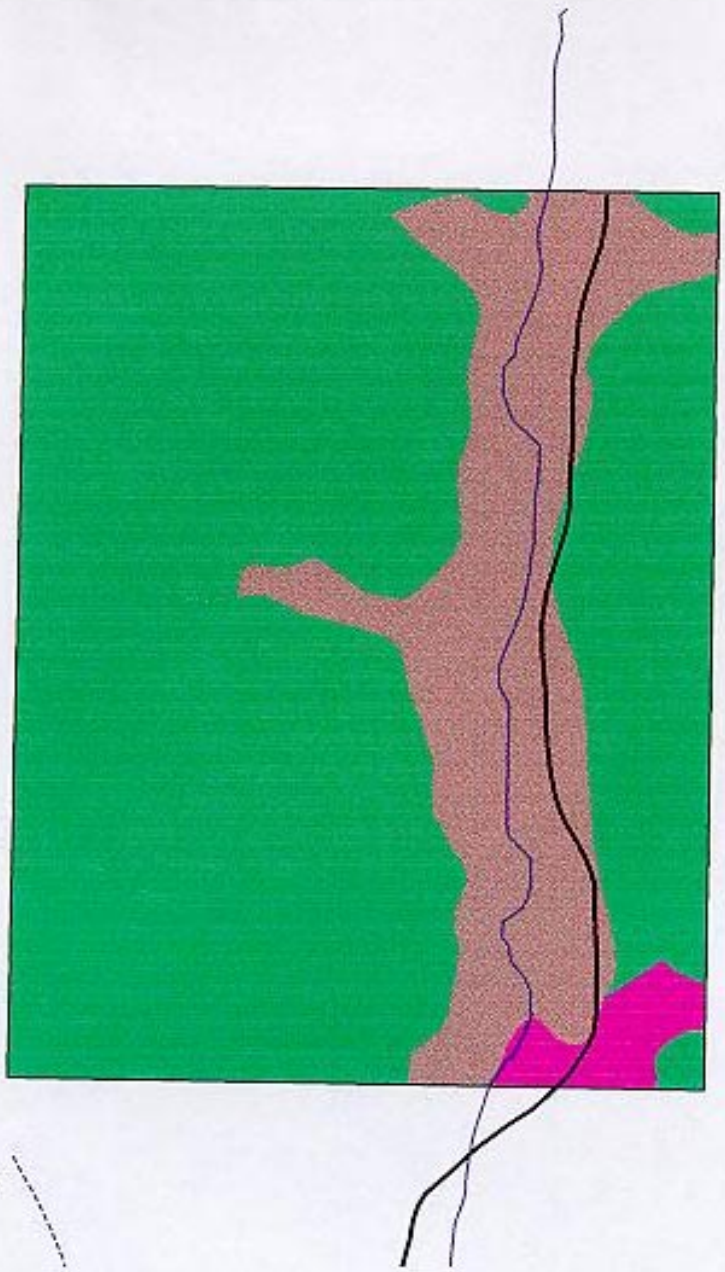
Roads
- IMPROVED
- RAILROAD
- HIGHWAYS
- 4WD TRAILS
- UNIMPROVED

Streams (CCT types)
- 1
- 2
- 3
- 4

Sclome Unit- Soils

Soils
- BRUSHER SILT LOAM
- CENTRAL PEAK LOAM
- FRIEDLANDER SILT LOAM
- GEORGECREEK SILT LOAM
- SCLOME SILTY CLAY LOAM

0 0.1 0.2 Miles



Property Boundary

Roads
- IMPROVED
- RAILROAD
- HIGHWAYS
- 4WD TRAILS
- UNIMPROVED

Streams (CCT types)
- 1
- 2
- 3
- 4

Current Conditions
- AGRICULTURE
- CONIFER-FOREST
- CONIFER-WOODLAND
- GRASSLAND
- RIPARIAN-FOREST
- RIPARIAN-SHRUB
- RIPARIAN-WETLAND
- ROCK
- SHRUB-STEPPE
- TALUS
- WATER

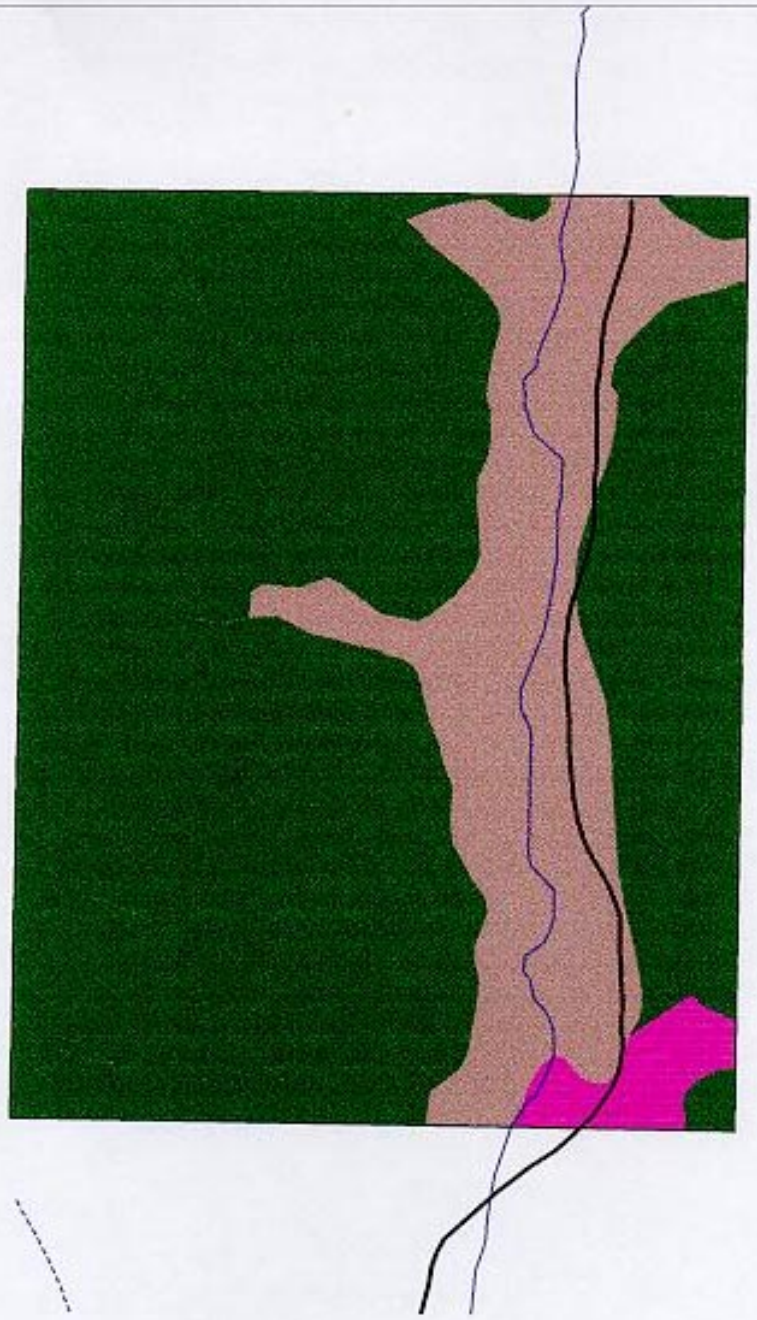
Sclome Unit- Current Conditions

N

W E

S

0 0.1 0.2 0.3 Miles



Property Boundary

Roads
- IMPROVED
- RAILROAD
- HIGHWAYS
- 4WD TRAILS
- UNIMPROVED

Streams (CCT types)
- 1
- 2
- 3
- 4

Future Conditions
- AGRICULTURE
- CONIFER-FOREST
- CONIFER-WOODLAND
- GRASSLAND
- RIPARIAN-FOREST
- RIPARIAN-SHRUB
- RIPARIAN-WETLAND
- ROCK
- SHRUB-STEPPE
- TALUS
- WATER

Sclome Unit-
Future Conditions

0 0.1 0.2 0.3 Miles

Baulne Management Unit.

The Baulne (pronounced bow-in) unit (366 acres) is composed of land parcels purchased from both William and Henry Kuehne (Figure 49). The former W. Kuehne parcel was purchased in 1993 and the H. Kuehne parcel was purchased in 1996. This unit is primarily a Douglas Fir Cool Moist association. The original owner cleared the bottomland area of forest vegetation to grow hay and cereal grains. The Kuehne's purchased the land for hay and pasture. The residence and outbuildings were located on the W. Kuehne portion of the unit. His laborer and ranch hand lived in the house until it was purchased for mitigation. In the winter of 1996 the snow load collapsed the roof and made the residence unlivable. The outbuildings were used prior to the Berg Brothers ranch purchase for storing Project equipment. The area is remote and security is a problem so project equipment and supplies are no longer stored in any of the outbuildings. A metal gate was installed on the access road to prevent unauthorized traffic and discourage vandalism to the outbuildings. The H. Kuehne portion of this unit was also used for cattle and/or hay production. A corral and loading chute are adjacent to the main access road at the entrance to the property. The perimeter of this unit is completely fenced but the posts and wire are old. Replacement of worn fence sections began in 1993 and will continue until fence integrity is adequate to prevent livestock trespass to the unit. The HEP cover types on this unit include agricultural (160 acres), conifer forest (191 acres), and riparian wetlands (15 acres). The habitat types on this unit are Ponderosa pine, Douglas Fir cool moist / Ponderosa pine phase, Douglas Fir warm moist and wetland. All the vegetative cover types have been altered by past land uses. The agricultural cover type replaced most of the Douglas fir warm moist (riparian forest) and wetland vegetation. Grazing, timber harvest and fire have changed the vegetation on the other habitat types to some degree.

Soils

The soils of this unit that support conifer forest vegetation are basically sandy bottomlands (Figure 50). The present vegetation occupying the site is composed of annual and perennial grasses, forbs, weeds, and dominated by a Ponderosa pine overstory. Riparian shrubs and trees are limited to small patches not suitable for farming or unsuitable species for grazing. The soils on this unit can be classified as either wetland or sandy loam soils. Soils underlying the riparian and agricultural areas are deep to moderately deep; poor to moderately drained composed of alluvium dominated by volcanic ash. Vegetation growing on these soils includes cottonwood, aspen, birch, and alder. Understory vegetation is dominated by snowberry with red-osier dogwood, mockorange, Oregon grape, rose, and pinegrass. Where water is present cattails, sedges and grasses occur. The sandy loam soils are moderately deep, well drained and formed from glacial till or weathered metamorphic rock usually capped with volcanic ash. The conifer forest cover type includes the Ponderosa Pine habitat type or conifer woodland PAG that occurs on the Raisio soils making up 38 percent of the unit. The rest of the conifer forest cover type is composed of the Douglas fir/Ponderosa pine habitat type on silt and sandy loam. Vegetation on these soils include Ponderosa pine, Douglas fir, western larch, ninebark, snowberry, oceanspray, serviceberry, pachistima, rose, spirea, Oregon grape, chokecherry, arrowleaf balsamroot, and pinegrass.

Management Goals for this unit:

This area has the potential to become a forested wetland surrounded by a Ponderosa pine / Douglas fir forest. Planting deciduous trees/shrubs along the channeled stream corridor will

restore portions of this area to a more natural condition for wildlife. Depending on the growth rate of the planted species, beaver will be allowed to colonize the area and maintain the system in a desired state for forested wetland species.

Short-term Management Activities

- Maintain the boundary fences to prevent livestock trespass.
- Control noxious weeds.
- Enhance the wetland cover type by planting deciduous trees/shrubs.
- Reduce the amount of agricultural cover type by restoring desired wetland vegetation where possible.
- Eliminate all potential hazards (collapsed house).
- Maintain the current forest conditions for the next five years.
- Plant cultural and subsistence vegetation within the wetland cover type to match historic conditions.
- Continue the ongoing operation and maintenance activities on this unit.

Long-term Management Activities

- Maintain the forest conditions to benefit selected wildlife species. Life requirements such as number of snags per acre, overall canopy closure, stand density and composition, desired understory vegetation for food and cover, etc., will be monitored and enhanced for selected species.
- Eliminate the agricultural cover type, but maintain a mosaic of open meadow areas, five to ten acres in size within the unit that will support deer and elk summer and fawning habitat requirements as well as foraging areas during spring and fall.
- Maintain and expand the forested wetland areas to support riparian obligate species with suitable habitat requirements.

Present Cover types and acres:
AGRICULTURAL COVER (160 acres)
This cover type was created to produce hay during dry years and as pasture in wet years. Part of this will be returned to a riparian deciduous forest wetland (22 acres). An additional 100 acres will be managed as a wet meadow. The remaining acres will be managed for a patchwork of open grasslands. Management for this unit includes passive and active strategies for ecosystem recovery. The planting of the riparian areas with species such as red-osier dogwood, birch, willow, aspen, and cottonwood will speed the recovery of this important ecotype. When these species dominate the vegetation in five to ten years, beavers will be allowed to manage the area as a natural system. When this occurs some time in the future a different species for HEP will need to be used to assess habitat conditions and provide BPA with habitat credits. Mourning dove was used to evaluate this cover type on this unit. The area contained abundant food but cover for reproduction was limited or absent. The increase of trees and shrubs on this cover type should increase the overall Habitat Suitability Index (HSI) rating for doves but the Yellow warbler or mink would be a more suitable species indicator.

CONIFER FOREST (191 acres)
Overstory Ponderosa pine and/or Douglas fir dominate the forested area. The unit and surrounding area was logged some time in the past. These species on suitable sites will be

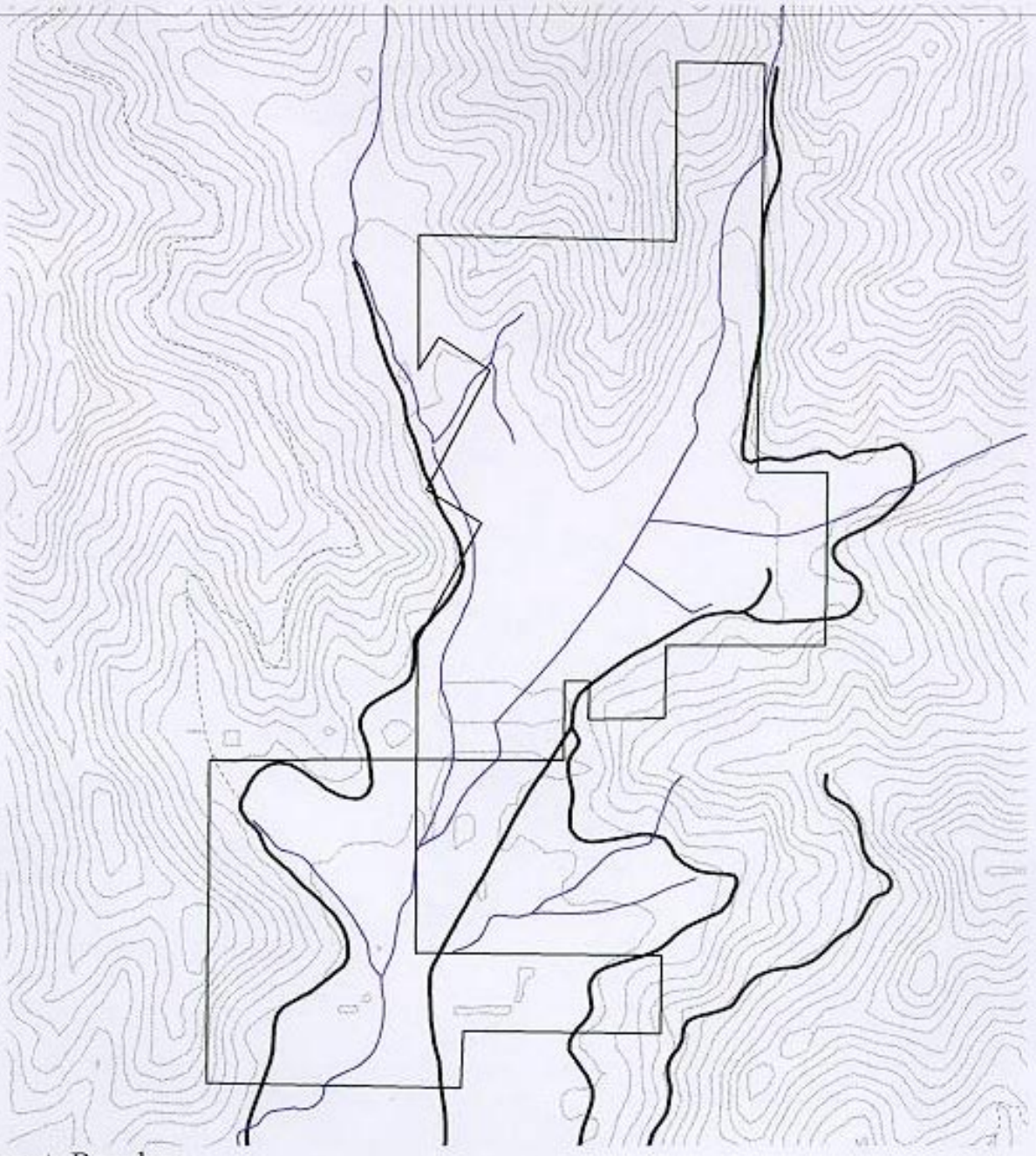
managed for open stands of mature pines and fir with associated understory vegetation mainly snowberry with pinegrass and forbs. The more moist sites will be managed for Douglas fir/ mallow ninebark and/or myrtle pachistima climax. Management actions for the forested areas are to promote mature stands of pine and fir with suitable snag densities throughout the area. Downy woodpecker was used to evaluate this cover type. The HSI rated 0.7 for this species because of the abundant food and cover. The HSI rating will go higher with the addition of more suitable snag habitat throughout this cover type.

RIVERINE COVER (15 acres)
This cover type was modified and drained to produce hay. Future management actions will expand this type on suitable soils thus reducing the agricultural cover type. The restored areas will be managed for riparian or riparian wetland forest. Mink was used to evaluate this type. The overall HIS was low because the areas measured lacked food and cover to support this species. Management actions to enhance and restore this type include increasing the number and diversity of riparian species (trees, shrubs, grasses and forbs). The amount of wetland habitat will be increased over time to more than 100 acres. The mink is an excellent indicator of habitat conditions in riparian areas and will be used for management until beavers become established. Once the riparian vegetation is established and expanding the HSI rating for mink should go up.

Table 19. Current and desired future cover types, HEP species and results for Baulne Unit.

Cover Type	HEP Species	HSI	Acres	HU's
CURRENT CONDITIONS				
Agriculture	M. Dove	0.5	160	80
Conifer Forest	D. Woodpecker	0.8	191	153
Riverine	Mink	0.3	15	4
FUTURE CONDITIONS				
Grassland	M. Dove	0.6	38	23
Forested Wetland	Mink	0.5	115	57
Conifer Forest	D. Woodpecker	0.8	191	153

Figure 51 shows the current conditions for this unit and future conditions are shown in Figure 52.

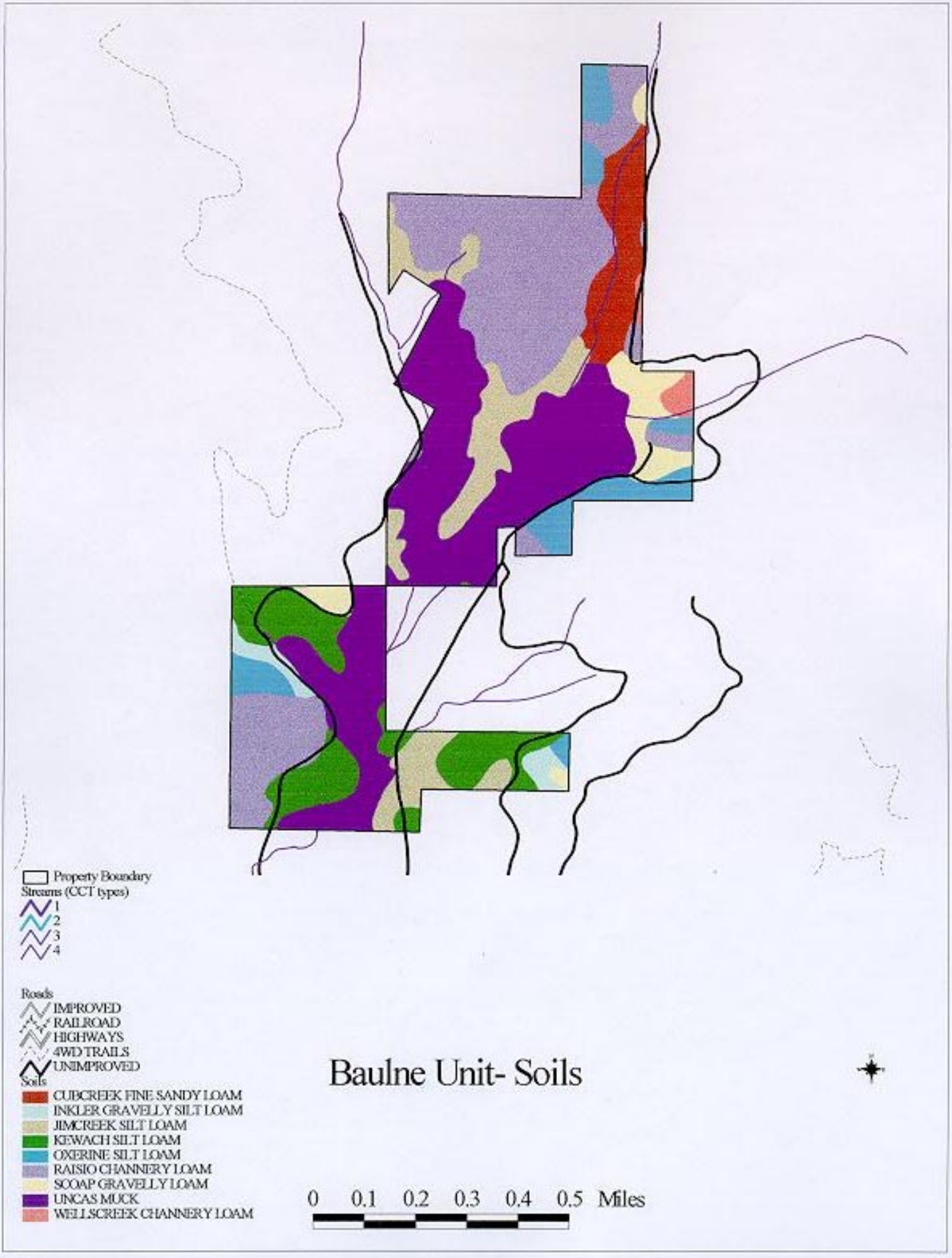


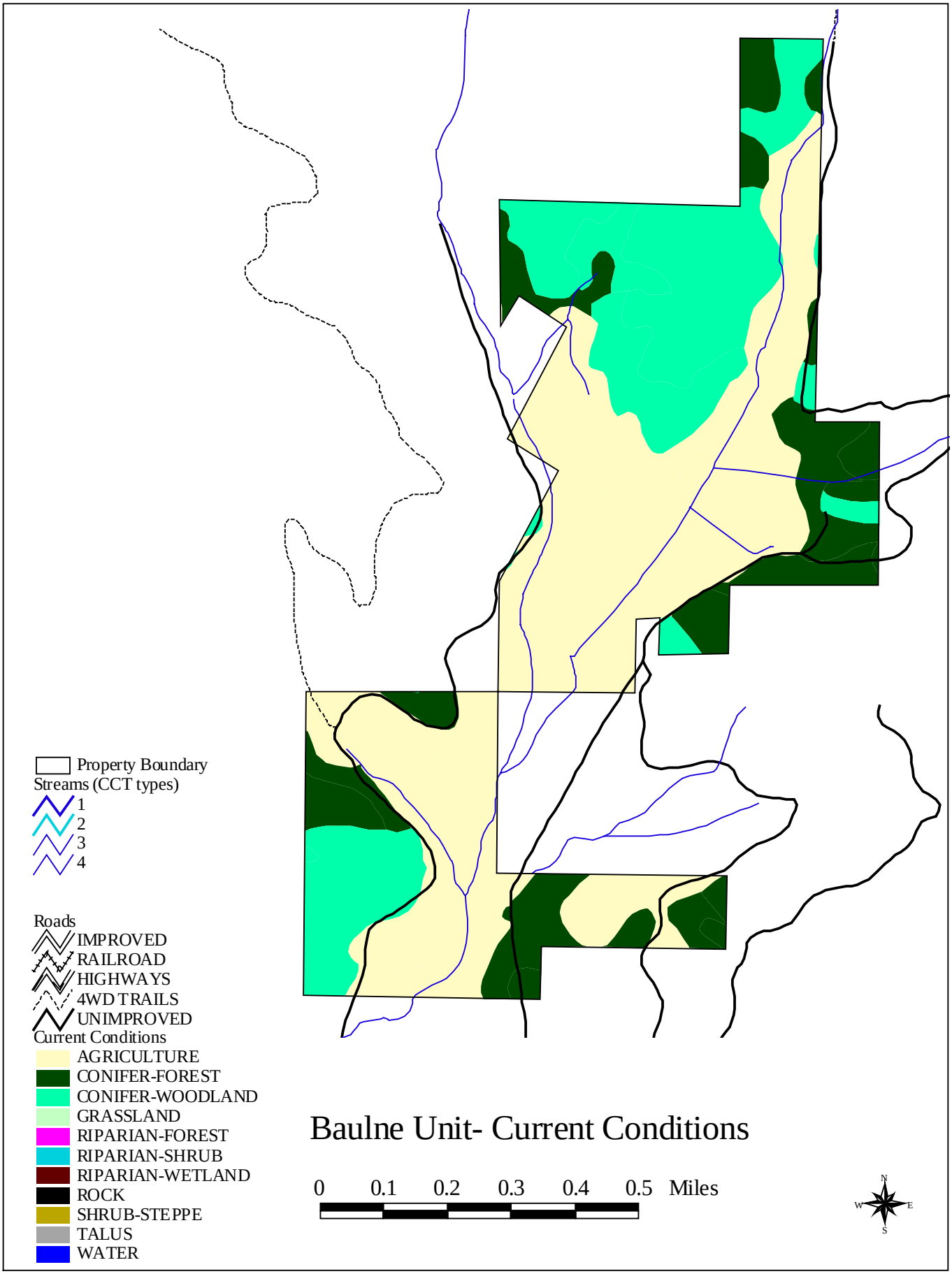
Property Boundary
Streams (CCT types)
1
2
3
4

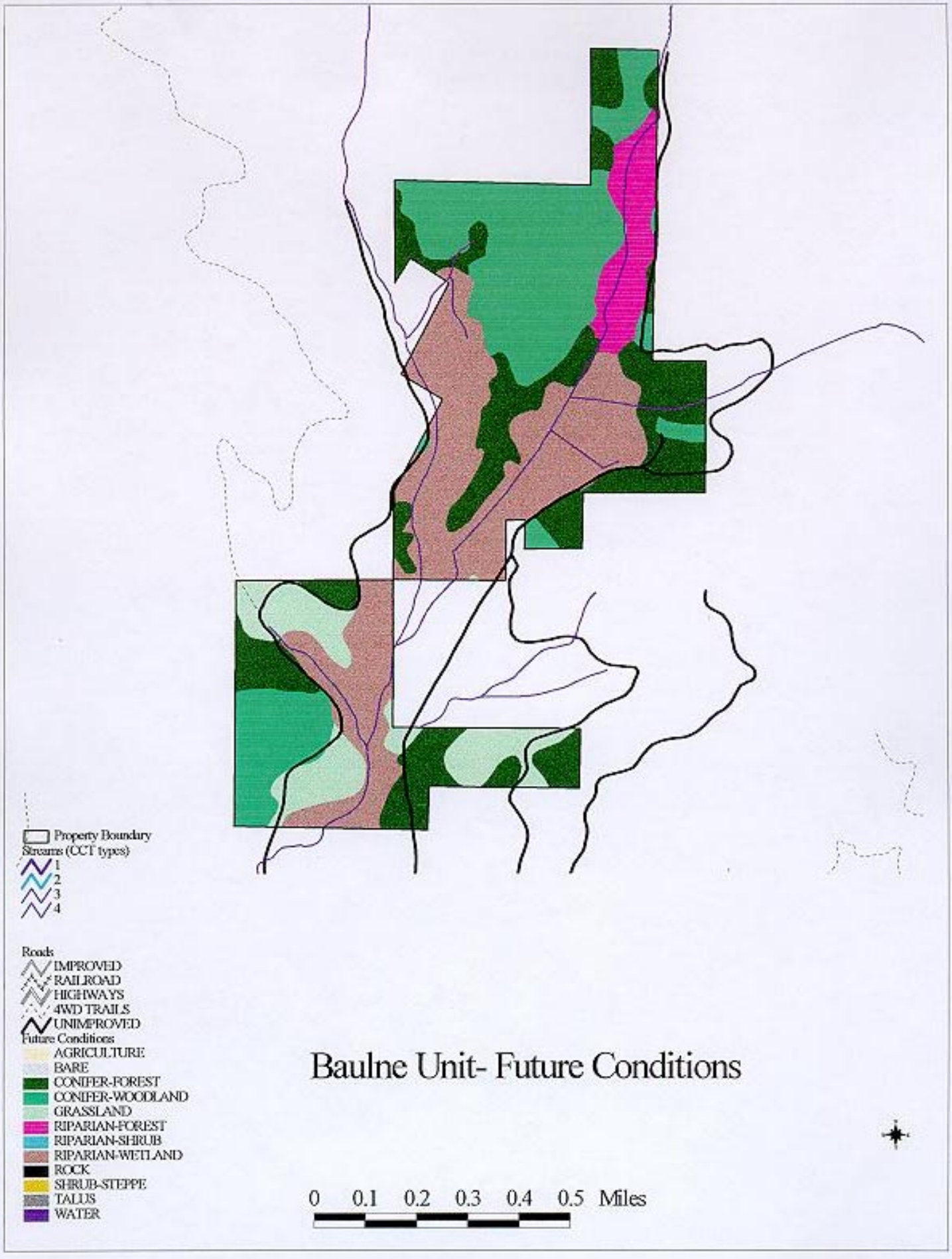
Baulne Unit- Topography

Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Contours (40ft.[E])

0 0.1 0.2 0.3 0.4 0.5 Miles


Property Boundary
Streams (CCT types)
1
2
3
4
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Soils
CUBCREEK FINE SANDY LOAM
INKLER GRAVELLY SILT LOAM
JIMCREEK SILT LOAM
KEWACH SILT LOAM
OXERINE SILT LOAM
RAISIO CHANNERY LOAM
SCOAP GRAVELLY LOAM
UNCAS MUCK
WELLSCREEK CHANNERY LOAM
Baulne Unit- Soils
0 0.1 0.2 0.3 0.4 0.5 Miles


Property Boundary
Streams (CCT types)
1
2
3
4
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Current Conditions
AGRICULTURE
CONIFER-FOREST
CONIFER-WOODLAND
GRASSLAND
RIPARIAN-FOREST
RIPARIAN-SHRUB
RIPARIAN-WETLAND
ROCK
SHRUB-STEPPE
TALUS
WATER
Baulne Unit- Current Conditions
0 0.1 0.2 0.3 0.4 0.5 Miles
N
W
E
S


Property Boundary
Streams (CCT types)
1
2
3
4
Roads
IMPROVED
RAILROAD
HIGHWAYS
4WD TRAILS
UNIMPROVED
Future Conditions
AGRICULTURE
BARE
CONIFER-FOREST
CONIFER-WOODLAND
GRASSLAND
RIPARIAN-FOREST
RIPARIAN-SHRUB
RIPARIAN-WETLAND
ROCK
SHRUB-STEPPE
TALUS
WATER
Baulne Unit- Future Conditions
0 0.1 0.2 0.3 0.4 0.5 Miles

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Appendix A

Current Task Team Members:

Steve Judd	Colville Confederated Tribes (CCT) Wildlife Department
Matt Berger	CCT Project Manager
Jerry Marco	CCT Fisheries Department
Jim Priest	CCT Timber, Fish & Wildlife (TFW)
Dan Hall	CCT Resource Inventory & Analysis (RIA)
Jim Orwin	Bureau of Indian Affairs (BIA) Land Operations
Ted Jenn	BIA Forestry
Chuck Jones	CCT Integrated Resource Management Planning (IRMP)
Patti Stone	CCT Environmental Trust
Pete Rice	CCT History/Archaeology
Paul Ashley	Washington Department of Fish and Wildlife (WDFW)

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Lawerence Fry – Tribal Livestock Association
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N.C. WA Resource Conservation & Development District
Blaine Delaney- Executive Director
133 E. Johnsen, Chelan, WA 98841

Tribal Members
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Smoker Marchand

Appendix B

Wildlife found on Project lands.

MAMMALS

Badger	*Taxidea taxus*
Beaver	*Castor canadensis*
Black bear	*Ursus americanus*
Bobcat	*Felis rufus*
Bushytail woodrat	*Neotoma cinerera*
Cottontail rabbit	*Sylvilagus nuttalli*
Coyote	*Canis latrans*
Deer mouse	*Peromyscus maniculatus*
Elk	*Cervus elaphus canadensis*
Great basin pocket mouse	*Perognathus parvus*
Mink	*Mustela vison*
Mule deer	*Odocoileus hemionus*
Muskrat	*Ondatra zibethica*
Raccoon	*Procyon lotor*
Red squirrel	*Tamiasciurus hudsonicus*
Sagebrush vole	*Largurus curtatus*
Snowshoe hare	*Lepus americanus*
White-tailed deer	*Odocoileus virginianus*
Yellow bellied marmot	*Marmota flaviventris*
Yellow pine chipmunk	*Eutamias amoenus*

BIRDS

Bald eagle	*Haliaeetus leucocephalus*
Barn swallow	*Hirundo rustica*
Blue grouse	*Dendragapus obscurus*
Burrowing owl	*Athene cunicularia*
California quail	*Callipepla californica*
Canada goose	*Branta canadensis*
Chukar	*Alectoris chuckar*
Coot	*Fulica americana*
Flicker	*Colaptes auratus*
Grasshopper sparrow	*Ammodramus savannarum*
Great blue heron	*Ardea herodias*
Great horned owl	*Bubo virginianus*
Goshawk	*Accipiter gentilis*
Horned lark	*Eremophila alpestris*
Hungarian partridge	*Perdix perdix*
Kingfisher	*Alcedinidae sp.*
Mallard	*Anus platyrhynchos*
Mourning dove	*Zenaida macroura*
Northern harrier hawk	*Circus cyaneus*

Osprey	*Pandion haliaetus*
Pileated woodpecker	*Dryocopus pileatus*
Red-tailed hawk	*Buteo jamaicensis*
Ring-necked pheasant	*Phasianus colchicus*
Ruffed grouse	*Bonasa umbellus*
Sharp-tailed grouse	*Tympanuchus phasianellus*
Spotted sandpiper	*Actitus colchicus*
Spruce grouse	*Dendragapus canadensis*
Turkey	*Meleagris gallopavo*
Western meadowlark	*Strunella neglecta*
Yellow warbler	*Denroica coronata*

REPTILES

Common garter snake	*Thamnophis sirtalis*
Gopher snake	*Pituophis melanoleucus*
Night snake	*Hypsiglena torguata*
Northern alligator lizard	*Elgaria coerulea*
Northern pacific rattlesnake	*Cortalus virdis*
Painted turtle	*Chrysemys picta*
Rubber boa	*Charina bottae*
Sagebrush lizard	*Sceloporus graciosus*
Short-horned lizard	*Phryosoma douglassii*
Western fence lizard	*Sceloporus occidentalis*
Western garter snake	*Thamnophis elegans*
Western skink	*Eumeces skiltonianus*
Yellow-bellied racer	*Coluber constrictor*

AMPHIBIANS

Columbia spotted frog	*Rana luteiventris*
Great basin spadefoot	*Scaphiopus intermontanus*
Long-toed salamander	*Ambystoma macrodactylum*
Pacific tree frog	*Pseudacris regilla*
Tiger salamander	*Ambystoma tigrinum*
Western toad	*Bufo boreas*

Appendix C

SPECIES LIST, CODES, SCIENTIFIC AND COMMON NAMES OF TREES, SHRUBS, AND HERBS.

TREES

CODE	SCIENTIFIC NAME	COMMON NAME
PIPO	*Pinus Ponderosa*	Ponderosa pine
PSME	*Pseudotsuga menziesii*	Douglas fir
POTR	*Populus trichocarpa*	Black cottonwood

SHRUBS

CODE	SCIENTIFIC NAME	COMMON NAME
ACGL	*Acer glabrum*	Mountain maple
AMAL	*Amelanchier alnifolia*	Serviceberry
COST	*Cornus stolonifera*	Red-osier dogwood
HODI	*Holodiscus discolor*	Oceanspray
PHMA	*Physocarpus malvaceus*	Mallow ninebark
PRVI	*Prunus virginiana*	Common chokecherry
PUTR	*Purshia tridentata*	Bitterbrush
RICE	*Ribes cereum*	Wax current
ROSA	*Rosa spp.*	Rose
SPBE	*Spiraea betulifolia*	Spirea

HERBS

CODE	SCIENTIFIC NAME	COMMON NAME
ACMI	*Achillea millefolium*	Yarrow
AGSP	*Agropyron spicatum*	Bluebunch wheatgrass
BASA	*Balsamorhiza sagittata*	Arrowleaf balsamroot
BRTE	*Bromus tectorum*	Cheatgrass
CARU	*Calamagrotis rubescens*	Pinegrass
ELGL	*Elymus glaucus*	Blue wildrye
FEID	*Festuca idahoensis*	Idaho fescue
FRAGA	*Fragaria spp.*	Strawberry
LUSE	*Lupinus sereceus*	Silky lupine
LUSU	*Lupinus sulphureus*	Sulfur lupine
ORHY	*Oryzopsis hymenoides*	Indian ricegrass
POSA	*POA sandbergii*	Sandberg bluegrass
STCO	*Stipa comata*	Needle and thread

APPENDIX D

ESTIMATED HELLSGATE PROJECT 5-YEAR BUDGET

SALARIES	HOURS	FY99	FY00	FY01	FY02	FY03
Supv. Bio.	120	2,164	2,164	2,164	2,164	2,164
Wildl. Bio.	2080	35,714	36,608	36,608	36,608	36,608
Wildl. Area Mgr.	2080	29,411	30,882	32,448	32,448	32,448
Ass. WAM	2080	0	0	0	17,238	17,238
Wildl. Tech.	1560	0	0	16,489	16,489	16,489
Seas. Laborers (2)	1560	31,356	32,978	16,489	0	0
Seas. Laborers (2)	1040	20,904	21,986	32,979	32,979	32,979
Temp. Laborer	1040	9,360	10,400	0	9,360	9,360
Clerical	520	6,349	6,380	6,380	6,380	6,380
SUB-TOTAL		**135,258**	**141,398**	**143,557**	**153,666**	**153,666**
MATERIALS & SUPPLIES		10,500	10,500	15,000	15,000	15,000
TELE & UTILITIES		2,900	2,900	3,000	3,000	3,500
TRAVEL		3,000	3,000	3,000	3,000	3,000
TRAINING		3,000	3,000	3,000	3,000	3,000
VEHICLES		28,249	28,249	30,000	30,000	30,000
O&M						
Equipment		8,000	8,000	6,000	5,000	5,000
Eq. Repair & Maintenance		2,500	2,500	2,000	2,000	2,000
Buildings		2,500	2,500	1,000	1,000	1,000
Weed control		8,000	8,000	8,000	8,000	8,000
Fencing		8,000	8,000	10,000	10,000	10,000
Seeding		4,000	4,000	5,000	5,000	5,000
Tree/shrubs		10,000	10,000	5,000	5,000	5,000
Sub-contractors		50,000	50,000	60,000	45,000	45,000
ENHANCEMENTS		15,000	15,000	15,000	15,000	15,000
SUB-TOTAL		**155,649**	**155,649**	**166,000**	**150,000**	**150,500**
INDIRECT of Salaries		53,021	55,428	56,274	60,237	60,237
Fringe		35,797	36,763	37,325	39,953	39,953
Grand Totals		***383,725***	***389,238***	***403,156***	***403,856***	***404,356***
Other Funding Sources		33,725	39,238	53,156	53,856	54,356
BPA Total Costs		**350,000**	**350,000**	**350,000**	**350,000**	**350,000**